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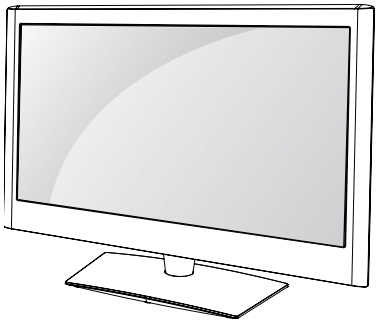
LED LCD TV
SERVICE MANUAL

CHASSIS : LD0AY

MODEL : 26LV255H 26LV255H-ZA

CAUTION
BEFORE SERVICING THE CHASSIS,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.



P/NO : MFL67180604 (1111-REV00)

Printed in Korea

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SAFETY PRECAUTIONS

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and Exploded View.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.

General Guidance

An **isolation Transformer should always be used** during the servicing of a receiver whose chassis is not isolated from the AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks.

It will also protect the receiver and it's components from being damaged by accidental shorts of the circuitry that may be inadvertently introduced during the service operation.

If any fuse (or Fusible Resistor) in this TV receiver is blown, replace it with the specified.

When replacing a high wattage resistor (Oxide Metal Film Resistor, over 1 W), keep the resistor 10 mm away from PCB.

Keep wires away from high voltage or high temperature parts.

Before returning the receiver to the customer,

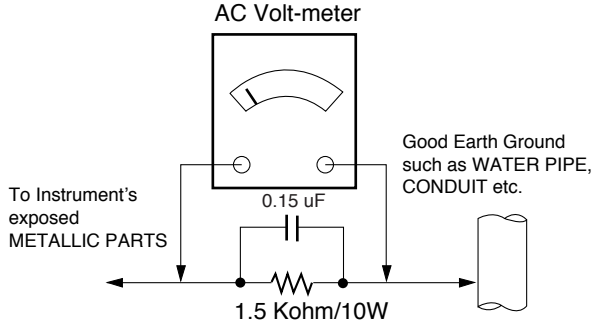
always perform an **AC leakage current check** on the exposed metallic parts of the cabinet, such as antennas, terminals, etc., to be sure the set is safe to operate without damage of electrical shock.

Leakage Current Cold Check(Antenna Cold Check)
With the instrument AC plug removed from AC source, connect an electrical jumper across the two AC plug prongs. Place the AC switch in the on position, connect one lead of ohm-meter to the AC plug prongs tied together and touch other ohm-meter lead in turn to each exposed metallic parts such as antenna terminals, phone jacks, etc.
If the exposed metallic part has a return path to the chassis, the measured resistance should be between 1 MΩ and 5.2 MΩ.
When the exposed metal has no return path to the chassis the reading must be infinite.
An other abnormality exists that must be corrected before the receiver is returned to the customer.

Leakage Current Hot Check (See below Figure)
Plug the AC cord directly into the AC outlet.

Do not use a line Isolation Transformer during this check.
Connect 1.5 K / 10 watt resistor in parallel with a 0.15 uF capacitor between a known good earth ground (Water Pipe, Conduit, etc.) and the exposed metallic parts.
Measure the AC voltage across the resistor using AC voltmeter with 1000 ohms/volt or more sensitivity.
Reverse plug the AC cord into the AC outlet and repeat AC voltage measurements for each exposed metallic part. Any voltage measured must not exceed 0.75 volt RMS which is corresponds to 0.5 mA.
In case any measurement is out of the limits specified, there is possibility of shock hazard and the set must be checked and repaired before it is returned to the customer.

Leakage Current Hot Check circuit



When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than 0.1 Ω
*Base on Adjustment standard

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SERVICING PRECAUTIONS

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the *SAFETY PRECAUTIONS* on page 3 of this publication.
NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
   a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
   b. Disconnecting or reconnecting any receiver electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
   CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe.
   Do not test high voltage by "drawing an arc".
3. Do not spray chemicals on or near this receiver or any of its assemblies.
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10 % (by volume) Acetone and 90 % (by volume) isopropyl alcohol (90 % - 99 % strength)
   CAUTION: This is a flammable mixture.
   Unless specified otherwise in this service manual, lubrication of contacts in not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
   Always remove the test receiver ground lead last.
8. *Use with this receiver only the test fixtures specified in this service manual.*
   CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid-state) devices can be damaged easily by static electricity. Such components commonly are called *Electrostatically Sensitive (ES) Devices*. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range or 500 °F to 600 °F.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25 cm) brush with a metal handle.
   Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
   a. Allow the soldering iron tip to reach normal temperature. (500 °F to 600 °F)
   b. Heat the component lead until the solder melts.
   c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
   a. Allow the soldering iron tip to reach a normal temperature (500 °F to 600 °F)
   b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
   c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil.
   d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

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IC Remove/Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal

1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement

1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

"Small-Signal" Discrete Transistor Removal/Replacement

1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

Power Output, Transistor Device Removal/Replacement

1. Heat and remove all solder from around the transistor leads.
2. Remove the heat sink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heat sink.

Diode Removal/Replacement

1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicular y to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor Removal/Replacement

1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.
   CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

At Other Connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side. Carefully crimp and solder the connections.
   CAUTION: Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.

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SPECIFICATION

NOTE : Specifications and others are subject to change without notice for improvement.

1. Application range

This specification is applied to the LCD TV used LD0AY chassis.

2. Requirement for Test

Each part is tested as below without special appointment.

1) Temperature: 25 ºC ± 5 ºC(77 ºF ± 9 ºF), CST: 40 ºC ± 5 ºC
2) Relative Humidity : 65 % ± 10 %
3) Power Voltage
   : Standard input voltage(AC 100-240 V~, 50 / 60 Hz)
   * Standard Voltage of each products is marked by models.
4) Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM.
5) The receiver must be operated for about 5 minutes prior to the adjustment.

3. Test method

1) Performance: LGE TV test method followed
2) Demanded other specification
   - Safety: CE, IEC specification
   - EMC:CE, IEC

4. Component Video Input (Y, P_B, P_R)

No.	Specification				Remark
	Resolution	H-freq(kHz)	V-freq(Hz)		
1.	720x480	15.73	60.00	SDTV,DVD 480i	
2.	720x480	15.63	59.94	SDTV,DVD 480i	
3.	720x480	31.47	59.94	480p	
4.	720x480	31.50	60.00	480p	
5.	720x576	15.625	50.00	SDTV,DVD 625 Line	
6.	720x576	31.25	50.00	HDTV 576p	
7.	1280x720	45.00	50.00	HDTV 720p	
8.	1280x720	44.96	59.94	HDTV 720p	
9.	1280x720	45.00	60.00	HDTV 720p	
10.	1920x1080	31.25	50.00	HDTV 1080i	
11.	1920x1080	33.75	60.00	HDTV 1080i	
12.	1920x1080	33.72	59.94	HDTV 1080i	
13.	1920x1080	56.250	50	HDTV 1080p	
14.	1920x1080	67.5	60	HDTV 1080p	

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5. RGB Input (PC)

No.	Specification				Proposed	Remark
	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel Clock(MHz)		
1.	720*400	31.468	70.08	28.321		For only DOS mode
2.	640*480	31.469	59.94	25.17	VESA	Input 848*480 60 Hz, 852*480 60 Hz -> 640*480 60 Hz Display
3.	800*600	37.879	60.31	40.00	VESA	
4.	1024*768	48.363	60.00	65.00	VESA(XGA)	
5.	1280*768	47.78	59.87	79.5	WXGA	
6.	1360*768	47.72	59.8	84.75	WXGA	HD Model
7.	1366*768	47.56	59.6	84.75	WXGA	WXGA Model1
8.	1280*1024	63.981	60.02	108.875	SXGA	FHD model
9.	1280*720	45	60	74.25	720p	DTV Standard
10.	1920*1080	67.5	60	148.5	WUXGA	FHD model

6. HDMI Input

(1) DTV Mode

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1.	720*480	31.469 / 31.5	59.94 / 60	27.00 / 27.03	SDTV 480P	
2.	720*576	31.25	50	54	SDTV 576P	
3.	1280*720	37.500	50	74.25	HDTV 720P	
4.	1280*720	44.96 / 45	59.94 / 60	74.17 / 74.25	HDTV 720P	
5.	1920*1080	33.72 / 33.75	59.94 / 60	74.17 / 74.25	HDTV 1080I	
6.	1920*1080	28.125	50.00	74.25	HDTV 1080I	
7.	1920*1080	26.97 / 27	23.97 / 24	74.17 / 74.25	HDTV 1080P	
8.	1920*1080	33.716 / 33.75	29.976 / 30.00	74.25	HDTV 1080P	
9.	1920*1080	56.250	50	148.5	HDTV 1080P	
10.	1920*1080	67.43 / 67.5	59.94 / 60	148.35 / 148.50	HDTV 1080P	

(2) PC Mode

No.	Resolution	H-freq(kHz)	V-freq.(Hz)	Pixel clock(MHz)	Proposed	Remark
1.	720*400	31.468	70.08	28.321		HDCP
2.	640*480	31.469	59.94	25.17	VESA	HDCP
3.	800*600	37.879	60.31	40.00	VESA	HDCP
4.	1024*768	48.363	60.00	65.00	VESA(XGA)	HDCP
5.	1280*768	47.78	59.87	79.5	WXGA	HDCP
6.	1360*768	47.72	59.8	84.75	WXGA	HDCP
7.	1280*720	45	60	74.25		HDCP
8.	1280*1024	63.981	60.2	108.875	SXGA	HDCP / FHD model
9.	1920*1080	67.5	60	148.5	WUXGA	HDCP / FHD model

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ADJUSTMENT INSTRUCTION

1. Application Range

This specification sheet is applied to all of the LCD TV with LD0AY chassis.

2. Designation

1) The adjustment is according to the order which is designated and which must be followed, according to the plan which can be changed only on agreeing.
2) Power Adjustment: Free Voltage
3) Magnetic Field Condition: Nil.
4) Input signal Unit: Product Specification Standard
5) Reserve after operation: Above 5 Minutes (Heat Run)
   Temperature : at 25 ºC ± 5 ºC
   Relative humidity : 65 % ± 10 %
   Input voltage : 220 V, 60 Hz
6) Adjustment equipments: Color analyzer(CA-210 or CA-110), DDC Adjustment Jig equipment, Service remote control.
7) Push the “IN STOP” key - For memory initialization.

Case1 : Software version up
1. After downloading S/W by USB, TV set will reboot automatically.
2. Push “In-stop” key.
3. Push “Power on” key.
4. Function inspection
5. After function inspection, Push “In-stop” key.

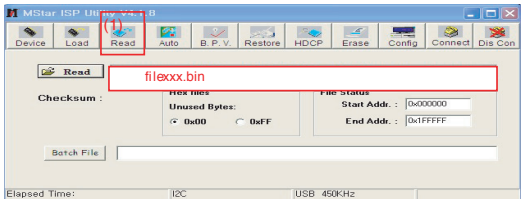
Case2 : Function check at the assembly line
1. When TV set is entering on the assembly line, Push “In-stop” key at first.
2. Push “Power on” key for turning it on.
   -> If you push “Power on” key, TV set will recover channel information by itself.
3. After function inspection, Push “In-stop” key.

3. Main PCB check process

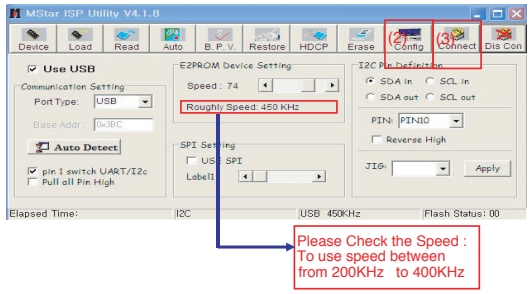
* APC - After Manual-Insult, executing APC

* Boot file Download

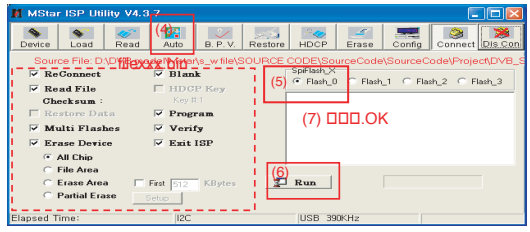
1) Execute ISP program “Mstar ISP Utility” and then click “Config” tab.



2) Set as below, and then click “Auto Detect” and check “OK” message. If “Error” is displayed, Check connection between computer, jig, and set.
3) Click “Read” tab, and then load download file(XXXX.bin) by clicking “Read”.
4) Click “Connect” tab. If “Can’t” is displayed, check connection between computer, jig, and set.

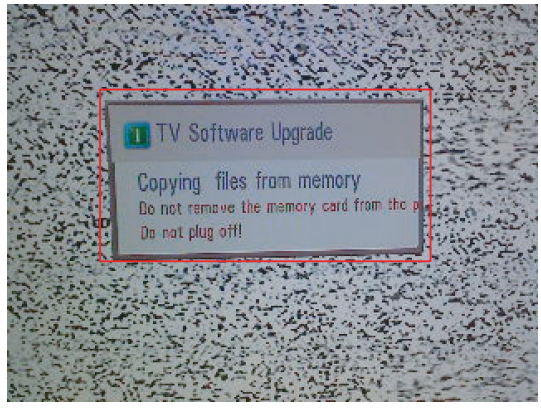


5) Click “Auto” tab and set as below.
6) Click “Run”.
7) After downloading, check “OK” message.



* USB DOWNLOAD

1) Put the USB Stick to the USB socket.
2) Automatically detecting update file in USB Stick.
   - If your downloaded program version in USB Stick is Low, it didn’t work. But your downloaded version is High, USB data is automatically detecting.
3) Show the message “Copying files from memory”.



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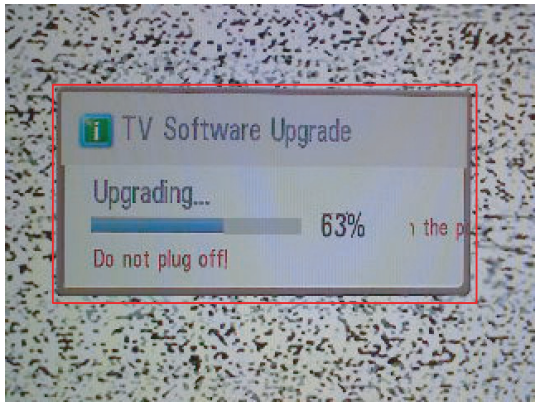
4) Updating is starting.



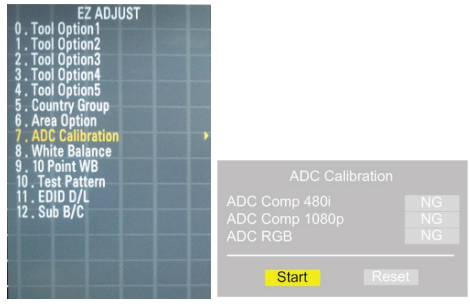
5) Uploading completed, the TV will restart automatically.
6) If your TV is turned on, check your updated version and Tool option.(explain the Tool option, next stage)
   * If downloading version is more high than your TV have, TV can lost all channel data. In this case, you have to channel recover. if all channel data is cleared, you didn't have a DTV/ATV test on production line.

*** After downloading, have to adjust Tool Option again.**

1) Push "IN-START" key in service remote control.
2) Select "Tool Option 1" and push "OK" key.
3) Punch in the number. (Each model hax their number)

3.1. ADC Process

(1) ADC
- Enter Service Mode by pushing "ADJ" key,
- Enter Internal ADC mode by pushing "▶" key at "7. ADC Calibration".



<Caution> Using 'power on' key of the Adjustment remote control, power on TV.

* ADC Calibration Protocol (RS232)

No	Item	CMD1	CMD2	Data0		
Enter Adjust Mode	Adjust 'Mode In'	A	A	0	0	When transfer the 'Mode In', Carry the command.
ADC adjust	ADC Adjust	A	D	1	0	Automatically adjustment (The use of a internal pattern)

Adjust Sequence
- aa 00 00 [Enter Adjust Mode]
- xb 00 40 [Component1 Input (480i)]
- ad 00 10 [Adjust 480i Comp1]
- xb 00 60 [RGB Input (1024*768)]
- ad 00 10 [Adjust 1024*768 RGB]
- aa 00 90 End Adjust mode

* Required equipment : Adjustment remote control.

3.2. Function Check

* Check display and sound
- Check Input and Signal items. (cf. work instructions)
  1) TV
  2) AV (SCART)
  3) COMPONENT (480i)
  4) RGB (PC : 1024 x 768 @ 60 Hz)
  5) HDMI
  6) PC Audio In
  * Display and Sound check is executed by Remote control.

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4. Total Assembly line process

4.1. Adjustment Preparation

· W/B Equipment condition
CA210
- CCFL/EEFL -> CH 9, Test signal : Inner pattern(85 IRE)
- LED(AUO) -> CH 14, Test signal : Inner pattern(80 IRE)

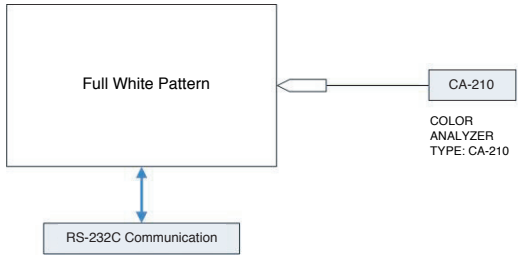
· Above 5 minutes H/run in the inner pattern. (“power on” key of adjustment remote control)

Cool	13,000	K	X=0.269(±0.002)	<Test Signal> Inner pattern (216gray,85IRE)
			Y=0.273(±0.002)	
Medium	9,300	K	X=0.285(±0.002)	
			Y=0.293(±0.002)	
Warm	6,500	K	X=0.313(±0.002)	
			Y=0.329(±0.002)	

· Edge LED W/B Table in process of time(Only LGD module)
CA210 : CH14, Test signal : Inner patter (80 IRE)

GP2	Aging Time (Min.)	Cool		Medium		Warm	
		X	Y	X	Y	X	Y
		269	273	285	293	313	329
1	0-2	279	288	295	308	319	338
2	3-5	278	286	294	306	318	336
3	6-9	277	285	293	305	317	335
4	10-19	276	283	292	303	316	333
5	20-35	274	280	290	300	314	330
6	36-49	272	277	288	297	312	327
7	50-79	271	275	287	295	311	325
8	80-149	270	274	286	294	310	324
9	Over 150	269	273	285	293	309	323

* Connecting picture of the measuring instrument
(On Automatic control)
Inside PATTERN is used when W/B is controlled. Connect to auto controller or push Adjustment remote control POWER ON -> Enter the mode of White-Balance, the pattern will come out.



* Auto-control interface and directions
1) Adjust in the place where the influx of light like floodlight around is blocked. (illumination is less than 10 lux.)
2) Adhere closely the Color Analyzer (CA210) to the module less than 10 cm distance, keep it with the surface of the Module and Color Analyzer’s prove vertically.(80° ~ 100°).
3) Aging time
- After aging start, keep the power on (no suspension of power supply) and heat-run over 5 minutes.
- Using ‘no signal’ or ‘full white pattern’ or the others, check the back light on.

· Auto adjustment Map(RS-232C)
RS-232C COMMAND
[CMD ID DATA]
Wb 00 00 White Balance Start
Wb 00 ff White Balance End

	RS-232C COMMAND [CMD ID DATA]			MIN	CENTER (DEFAULT)			MAX
	Cool	Mid	Warm		Cool	Mid	Warm	
R Gain	jg	Ja	jd	00	172	192	192	192
G Gain	jh	Jb	je	00	172	192	192	192
B Gain	ji	Jc	jf	00	192	192	172	192
R Cut					64	64	64	128
G Cut					64	64	64	128
B Cut					64	64	64	128

** Caution **
Color Temperature : COOL, Medium, Warm.
One of R Gain/G Gain/ B Gain should be kept on 0xC0, and adjust other two lower than C0.
(when R/G/B Gain are all C0, it is the FULL Dynamic Range of Module.)

* Manual W/B process using adjusts Remote control.
• After enter Service Mode by pushing “ADJ” key,
• Enter White Balance by pushing “►” key at “8. White Balance”.

* After done all adjustments, Press “In-start” button and compare Tool option and Area option value with its BOM, if it is correctly same then unplug the AC cable. If it is not same, then correct it same with BOM and unplug AC cable. For correct it to the model’s module from factory Jig model.
* Push the “IN STOP” key after completing the function inspection. And Mechanical Power Switch must be set “ON”.

4.2. DDC EDID Write (RGB 128Byte)

• Connect D-sub Signal Cable to D-sub Jack.
• Write EDID Data to EEPROM(24C02) by using DDC2B protocol.
• Check whether written EDID data is correct or not.
* For Service main Assembly, EDID have to be downloaded to Insert Process in advance.

4.3. DDC EDID Write (HDMI 256Byte)

• Connect HDMI Signal Cable to HDMI Jack.
• Write EDID Data to EEPROM(24C02) by using DDC2B protocol.
• Check whether written EDID data is correct or not.
* For Service main Assembly, EDID have to be downloaded to Insert Process in advance.

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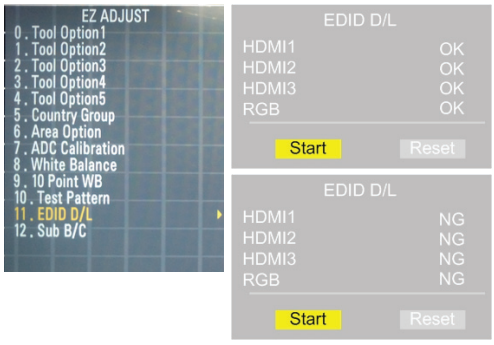
4.4. EDID DATA

1) All Data : HEXA Value
2) Changeable Data :
   *: Serial No : Controlled / Data:01
   **: Month : Controlled / Data:00
   ***: Year : Controlled
   ****: Check sum

- Auto Download

- After enter Service Mode by pushing “ADJ” key,
- Enter EDID D/L mode.
- Enter “START” by pushing “OK” key.



<Caution> Never connect HDMI & D-sub cable when EDID download

* Edid data and Model option download (RS232)

NO	Item	CMD1	CMD2	Data0		
Enter download Mode	Download ‘Mode In’	A	A	0	0	When transfer the ‘Mode In’, Carry the command.
EDID data and Model option download	Download	A	E	00	10	Automatically Download (The use of a internal pattern)

- Manual Download

* Caution
1) Use the proper signal cable for EDID Download.
   - Analog EDID : Pin3 exists
   - Digital EDID : Pin3 exists
2) Never connect HDMI & D-sub Cable at the same time.
3) Use the proper cables below for EDID Writing.
4) Download HDMI1, HDMI2, separately because HDMI1 is different from HDMI2.

For Analog EDID	For HDMI EDID
D-sub to D-sub	DVI-D to HDMI or HDMI to HDMI

Item	Condition	Data(Hex)
Manufacturer ID	GSM	1E6D
Version	Digital : 1	01
Revision	Digital : 3	03

1) FHD RGB EDID data

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	a		b			
10	c		01	03	68	10	09	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	81	C0	61	40	45	40	31	40	01	01
30	01	01	01	01	01	01	1B	21	50	A0	51	00	1E	30	48	88
40	35	00	A0	5A	00	00	00	1C	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	A0	5A	00	00	00	1E	00	00	00	FD	00	3A
60	3E	1F	46	10	00	0A	20	20	20	20	20	20	d			
70	d														00	e
80	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
90	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
A0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
B0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
C0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
D0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
E0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
F0	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF

2)HD HDMI EDID data

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	a		b			
10	c		01	03	80	10	09	78	0A	EE	91	A3	54	4C	99	26
20	0F	50	54	A1	08	00	81	C0	61	40	45	40	31	40	01	01
30	01	01	01	01	01	01	1B	21	50	A0	51	00	1E	30	48	88
40	35	00	A0	5A	00	00	00	1C	01	1D	00	72	51	D0	1E	20
50	6E	28	55	00	A0	5A	00	00	00	1E	00	00	00	FD	00	3A
60	3E	1F	46	10	00	0A	20	20	20	20	20	20	d			
70	d														01	e
80	02	03	20	F1	4E	10	1F	84	13	05	14	03	02	12	20	21
90	22	15	01	26	15	07	50	09	57	07	f					
A0	f		80	18	71	1C	16	20	58	2C	25	00	A0	5A	00	00
B0	00	9E	01	1D	00	80	51	D0	0C	20	40	80	35	00	A0	5A
C0	00	00	00	1E	8C	0A	D0	8A	20	E0	2D	10	10	3E	96	00
D0	A0	5A	00	00	00	18	02	3A	80	18	71	38	2D	40	58	2C
E0	45	00	A0	5A	00	00	00	1E	01	1D	80	D0	72	1C	16	20
F0	10	2C	25	80	A0	5A	00	00	00	9E	00	00	00	00	00	e

* Detail EDID Options are below

ⓐ Product ID

Model Name	HEX	EDID Table	DDC Function
HD Model	0000	00 00	Analog/Digital

ⓑ Serial No: Controlled on production line.

ⓒ Month, Year: Controlled on production line:
ex) Monthly : ‘02’ -> ‘02’
Year : ‘2009’ -> ‘13’

ⓓ Model Name(Hex):

MODEL	MODEL NAME(HEX)
LG TV	00 00 00 FC 00 4C 47 20 54 56 0A 20 20 20 20 20 20 20

ⓔ Checksum: Changeable by total EDID data.

EDID C/S data		HD	
		HDMI	RGB
Check sum (Hex)	Block 0	B4	CD
	Block 1	65(HDMI1)	
		55(HDMI2)	
		45(HDMI3)	

ⓕ Vendor Specific(HDMI)

INPUT	MODEL NAME(HEX)
HDMI1	65030C001000
HDMI2	65030C002000
HDMI3	65030C003000

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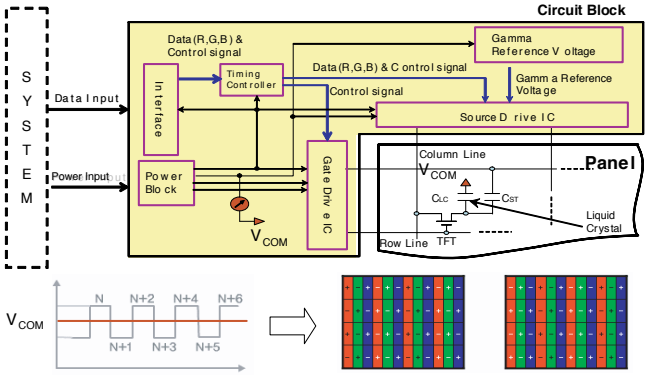
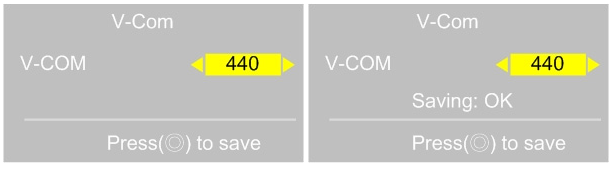
4.5. V-COM Adjust(Only LGD(M+S) Module)

- Why need Vcom adjustment?

■ The Vcom (Common Voltage) is a Reference Voltage of Liquid Crystal Driving.
-> Liquid Crystal need for Polarity Change with every frame.



- Adjust sequence
  · Press the PIP key of the Adjustment remote control.(This PIP key is hot key to enter the VCOM adjusting mode.)
  (Or After enter Service Mode by pushing “ADJ” key, then Enter V-Com Adjust mode by pushing “►” key at “10. V-Com”)
  · As pushing the right or the left key on the remote control, and find the V-COM value which is no or minimized the Flicker. (If there is no flicker at default value, Press the exit key and finish the VCOM adjustment.)
  · Push the “OK” key to store value. Then the message “Saving OK” is pop.
  · Press the exit key to finish VCOM adjustment.



(Visual Adjust and control the Voltage level)

4.6. Outgoing condition Configuration

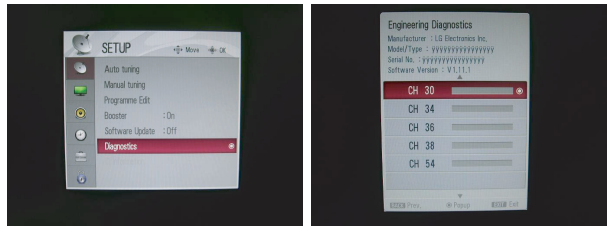
- When pressing IN-STOP key by Service remote control, Red LED are blinked alternatively. And then automatically turn off. (Must not AC power OFF during blinking)

4.7. Hi-pot test

Confirm whether is normal or not when between power board’s ac block and GND is impacted on 1.5 kV(dc) or 2.2 kV(dc) for one second.

5. Model name & Serial number D/L

- Press “Power on” key of service remote control. (Baud rate : 115200 bps)
- Connect RS232 Signal Cable to RS-232 Jack.
- Write Serial number by use RS-232.
- Must check the serial number at the Diagnostics of SET UP menu. (Refer to below.)



5.1. Signal TABLE

CMD	LENGTH	ADH	ADL	DATA_1	. . .	Data_n	CS	DELAY

CMD : A0h
LENGTH : 85~94h (1~16 bytes)
ADH : EEPROM Sub Address high (00~1F)
ADL : EEPROM Sub Address low (00~FF)
Data : Write data
CS : CMD+LENGTH+ADH+ADL+Data_1+…+Data_n
Delay : 20ms

5.2. Command Set

No.	Adjust mode	CMD(hex)	LENGTH(hex)	Description
1	EEPROM WRITE	A0h	84h+n	n-bytes Write(n=1~16)

* Description
FOS Default write : <7mode data> write
Vtotal, V_Frequency, Sync_Polarity, Htotal, Hstart, Vstart, 0, Phase
Data write: Model name and Serial number write in EEPROM,.

5.3. Method & notice

A. Serial number D/L is using of scan equipment.
B. Setting of scan equipment operated by Manufacturing Technology Group.
C. Serial number D/L must be conformed when it is produced in production line, because serial number D/L is mandatory by D-book 4.0.

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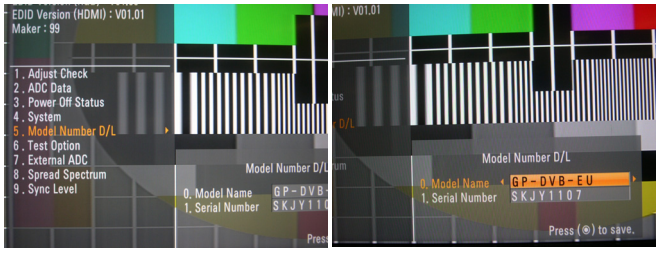
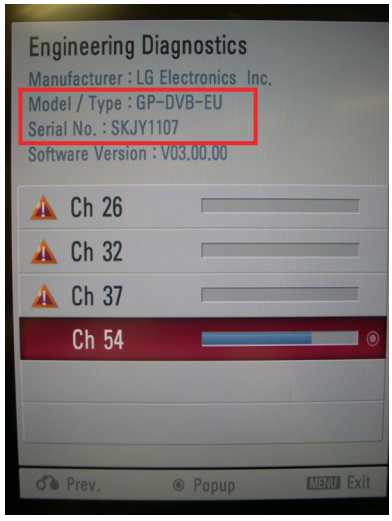
* Manual Download (Model Name and Serial Number)
If the TV set is downloaded by OTA or Service man, sometimes model name or serial number is initialized.(Not always)
There is impossible to download by bar code scan, so It need Manual download.

1) Press the 'Instart' key of Adjustment remote control.
2) Go to the menu '5.Model Number D/L' like below photo.
3) Input the Factory model name(ex 42LD450-ZA) or Serial number like photo.



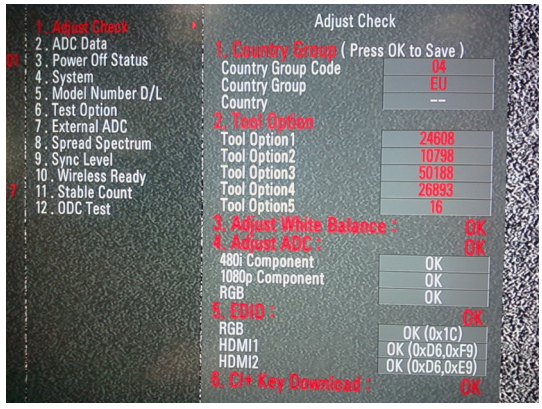
4) Check the model name Instart menu. -> Factory name displayed. (ex 42LD450-ZA)
5) Check the Diagnostics. (DTV country only) -> Buyer model displayed. (ex 42LD450)



6. CI+ Key Download method

(1) Download Procedure

1) Press "Power on" key of a service remote control.
(Baud rate : 115200 bps)
2) Connect RS232-C Signal Cable.
3) Write CI+ Key through RS-232-C.
4) Check whether the key was downloaded or not at 'In Start' menu.(Refer to below).



=> Check the Download to CI+ Key value in LGset.

1. Check the method of CI+ Key value.
a. Check the method on Instart menu.
b. Check the method of RS232C Command.
1) Into the main assembly mode (RS232 : aa 00 00)

CMD 1	CMD 2	Data 0	
A	A	0	0

2) Check the key download for transmitted command.
(RS232 : ci 00 10)

CMD 1	CMD 2	Data 0	
C	I	1	0

3) Result value
- Normally status for download : OKx
- Abnormally status for download : NGx

2. Check the method of CI+ Key value. (RS232)
1) Into the main assembly mode (RS232 : aa 00 00)

CMD 1	CMD 2	Data 0	
A	A	0	0

2) Check the method of CI+ key by command.
(RS232 : ci 00 20)

CMD 1	CMD 2	Data 0	
C	I	2	0

3) Result value
i 01 OK 1d1852d21c1ed5dcx
→ CI+ key Value

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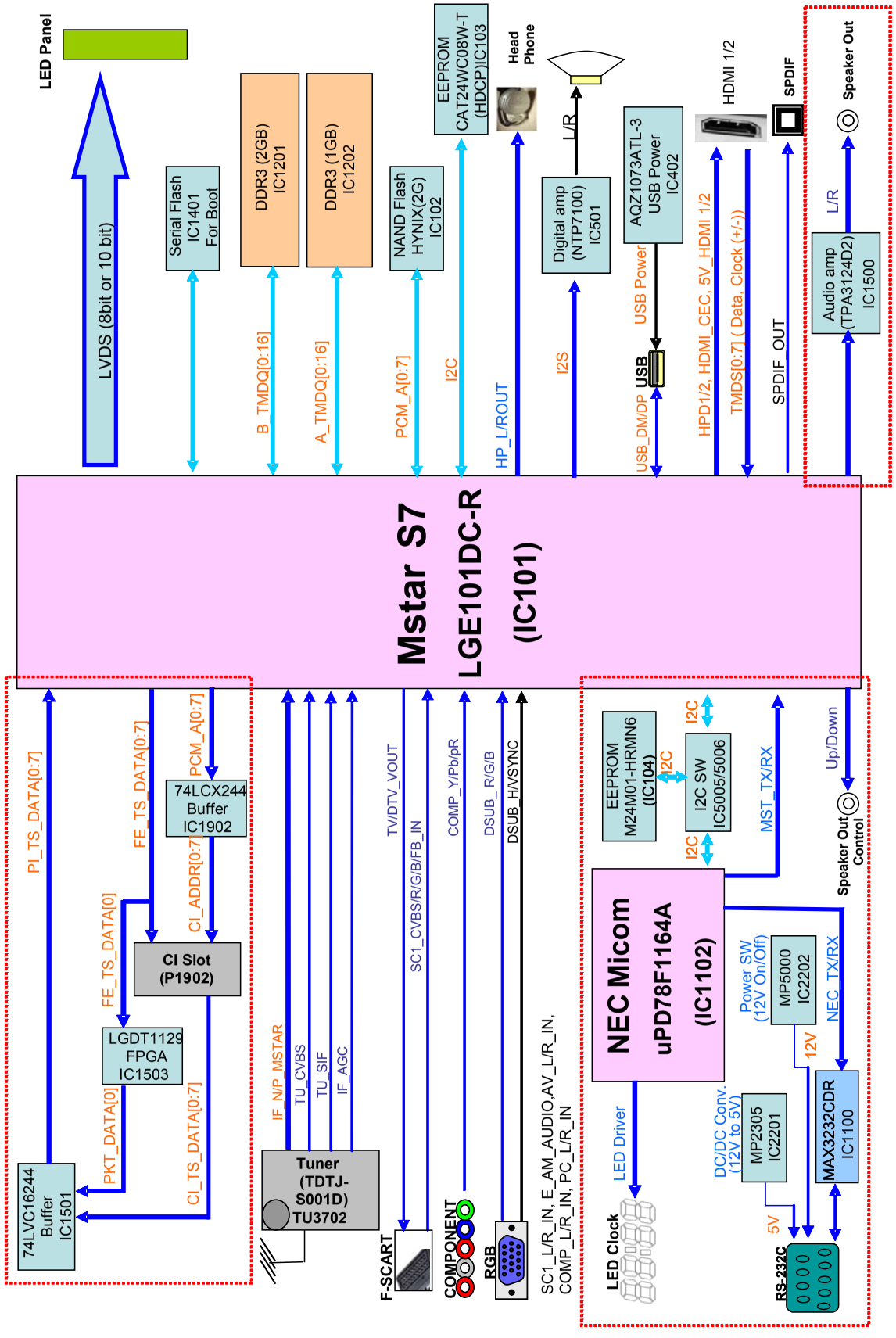
BLOCK DIAGRAM



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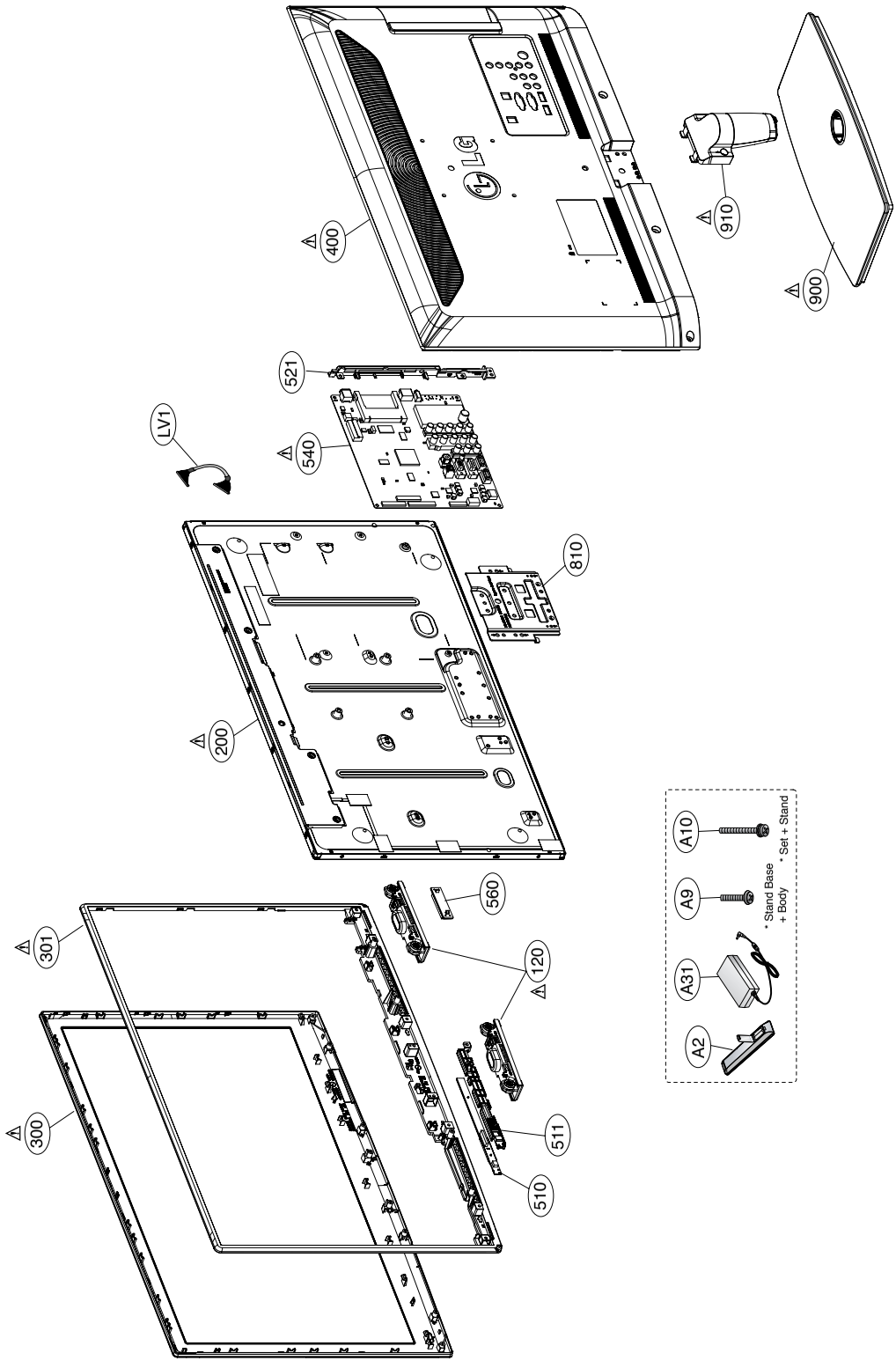
EXPLODED VIEW

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and EXPLODED VIEW.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.



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S7M-PLUS_DivX_MS10

LGE107DC-RP [S7M+ DIVX/MS10]

NAND FLASH MEMORY

IC102
HY27UF082G2B-TPCB
2GBIT_HYNIX
EAN60708701

/PF_CE0
H : Serial Flash
L : NAND Flash
/PF_CE1
H : 16 bit
L : 8 bit

+3.3V_Normal
/F_RB
/PF_OE
/PF_CE0
/PF_CE1
/PF_ALE
/PF_WE
/PF_WP
PCM_A[0-7]
PCM_A[3]
PCM_A[2]
PCM_A[1]
PCM_A[0]
PCM_A[7]
PCM_A[6]
PCM_A[5]
PCM_A[4]
AR101
AR102
22
R107 1K
R109 3.9K
R1081K
R105 1K OPT
R104 10K OPT
R106 1K
R102 4.7K
C101 0.1uF
C102 10uF
C103 6.1uF
Q101 KRC103S OPT

<T3 CHIP Config(AUD_LRCH)>

Boot from SPI flash : 1'b0
Boot from NOR flash : 1'b1

<T3 CHIP Config>
(AUD_SCK, AUD_MASTER_CLK, PWM1, PWM0)

MIPS_no_EJ_NOR8 : 4'h3 (MIPS as host. No EJ PAD. Byte mode NAND flash.)
MIPS_EJ1_NOR8 : 4'h4 (MIPS as host. EJ use PAD1. Byte mode NAND flash.)
MIPS_EJ2_NOR8 : 4'h5 (MIPS as host. EJ use PAD2. Byte mode NAND flash.)
B51_Secure_no_scramble : 4'hb (8051 as host. Internal SPI flash secure boot, no scramble)
B51_Sesure_scramble : 4'hc (8051 as host. Internal SPI flash secure boot with scarmble)

+3.3V_Normal
AUD_MASTER_CLK
R148 56
C112 100pF 50V
R115 4.7K
R117 4.7K
R123 4.7K OPT
R125 4.7K OPT
R116 4.7K OPT
R118 4.7K OPT
R121 4.7K
R124 4.7K
R126 4.7K
AUD_LRCH
AUD_SCK
AUD_MASTER_CLK_0
PWM1
PWM0

IC101

PCM_D[0-7]
PCM_A[0-14]
PCM_REG
/PCM_OE
/PCM_WE
/PCM_IORD
/PCM_IOWR
/PCM_CE
/PCM_IRQA
/PCM_CD
/PCM_WAIT
PCM_RST
+5V_Normal
R132 10K
R133 10K
C108 0.1uF OPT
C109 0.1uF
AR104
AR103
22

PCM_D0 PCM_D1 PCM_D2 PCM_D3 PCM_D4 PCM_D5 PCM_D6 PCM_D7
PCM_A0 PCM_A1 PCM_A2 PCM_A3 PCM_A4 PCM_A5 PCM_A6 PCM_A7 PCM_A8 PCM_A9 PCM_A10 PCM_A11 PCM_A12 PCM_A13 PCM_A14
PCM_REG_N
PCM_OE_N PCM_WE_N PCM_IORD_N PCM_IOWR_N
PCM_CE_N PCM_IRQA_N PCM_CD_N PCM_WAIT_N PCM_RESET
PCM_PF_CE0Z PCM_PF_CE1Z PCM_PF_OEZ PCM_PF_WEZ PCM_PF_ALE PCM_PF_AD[15] PCM_PF_RBZ
UART_TX2/GPIO65 UART_RX2/GPIO64
DDCR_DA/GPIO71 DDCR_CK/GPIO72
DDCA_DA/UART0_TX DDCA_CK/UART0_RX
PWM0/GPIO66 PWM1/GPIO67 PWM2/GPIO68 PWM3/GPIO69 PWM4/GPIO70
SAR0/GPIO31 SAR1/GPIO32 SAR2/GPIO33 SAR3/GPIO34 SAR4/GPIO35

GPIO143/TCON0 GPIO145/TCON2 GPIO147/TCON4 GPIO149/TCON6 GPIO151/TCON8
GPIO36/UART3_RX GPIO37/UART3_TX GPIO38 GPIO39 GPIO40 GPIO41 GPIO42
GPIO50/UART1_RX GPIO51/UART1_TX
GPIO6/PM0/INT0 GPIO7/PM1/PM_UART_TX GPIO8/PM2 GPIO9/PM3 GPIO10/PM4 GPIO11/PM5/PM_UART_RX/INT1 PM_SPI_CS1/GPIO12/PM6 PM_SPI_WP1/GPIO13/PM7 PM_SPI_WP2/GPIO14/PM8/INT2 GPIO15/PM9 PM_SPI_CS2/GPIO16/PM10 GPIO17/PM11/INT3 GPIO18/PM12/INT4
PM_SPI_CK/GPIO1 PM_SPI_CZ/GPIO0 PM_SPI_DI/GPIO2 PM_SPI_DO/GPIO3
TS0_CLK TS0_VLD TS0_SYNC TS0_D0 TS0_D1 TS0_D2 TS0_D3 TS0_D4 TS0_D5 TS0_D6 TS0_D7
TS1_CLK TS1_VLD TS1_SYNC TS1_D0 TS1_D1 TS1_D2 TS1_D3 TS1_D4 TS1_D5 TS1_D6 TS1_D7
MPIF_CLK MPIF_CS_N MPIF_BUSY MPIF_D0 MPIF_D1 MPIF_D2 MPIF_D3

5V_DET_HDMI_1
5V_DET_HDMI_2
5V_DET_HDMI_4
EXT_VOL+
EXT_VOL-
SC1/COMP1_DET
ERROR_OUT
MODEL_OPT_0
MST_NEC_RX
MST_NEC_TX
USB1_OCD
USB1_CTL
HP_DET
CONTROL_ATTEN
MODEL_OPT_6
MODEL_OPT_1
/FLASH_WP
MODEL_OPT_2
TUNER_RESET
DEMOD_RESET
SPI_SCK
/SPI_CS
SPI_SDI
SPI_SDO
for SERIAL FLASH
CI_TS_CLK
CI_TS_VAL
CI_TS_SYNC
CI_TS_DATA[0-7]
from CI SLOT
CI_TS_DATA[0] CI_TS_DATA[1] CI_TS_DATA[2] CI_TS_DATA[3] CI_TS_DATA[4] CI_TS_DATA[5] CI_TS_DATA[6] CI_TS_DATA[7]
FE_TS_CLK
FE_TS_VAL_ERR
FE_TS_SYNC
FE_TS_DATA[0-7]
Internal demod out
/External demod in
FE_TS_DATA[0] FE_TS_DATA[1] FE_TS_DATA[2] FE_TS_DATA[3] FE_TS_DATA[4] FE_TS_DATA[5] FE_TS_DATA[6] FE_TS_DATA[7]
Delete /PIF_SPI_CS
R160 10

S7_TXD
S7_RXD
for SYSTEM/HDCP EEPROM&URSA3
S7_EEPROM_SDA
S7_EEPROM_SCL
RGB_DDC_SDA
RGB_DDC_SCL
R134 22
R135 22
R136 22
R137 22
R138 22
R139 22
M23 N23 M22 N22 A5 B5

DSUB_DET
MODEL_OPT_3
PCM_5V_CTL
C6 B6 C8 C7 A6

IC102-*1
NAND02GW3B2DN6E
2GBIT_NUMONYX

S7R

S7R_BASIC S7R_MS10 S7R_DivX S7R_DivX_MS10 S7R_RM

S7MR

S7MR_BASIC S7MR_MS10 S7MR_DivX S7MR_DivX_MS10 S7MR_RM

EEPROM_1MBIT_ATMEL
IC104-*1
AT24C1024BN-SH-T

S7MR-PLUS

S7M-PLUS_BASIC S7M-PLUS_MS10 S7M-PLUS_DivX S7M-PLUS_RM

I2C

+3.3V_Normal +3.3V_ST
R160 10K
R161 4.7K
R140 4.7K
R141 4.7K
R142 2.2K
R143 2.2K
R144 4.7K
R145 4.7K
EEPROM_SDA
EEPROM_SCL
NEC_SDA
NEC_SCL
AMP_SDA
AMP_SCL
PI_SDA
PI_SCL

DIMMING

A_DIM
PWM_DIM
R156 10K
R157 100
C111 2.2uF
PWM0
PWM2

HDCP EEPROM

+3.5V_ST
HDCP_EEPROM_CATALYST_OLD
IC103
CAT24WC08W-T
$0.199
R113 4.7K
C107 0.1uF
R127 4.7K
R128 22
R129 22
EEPROM_SCL
EEPROM_SDA
Addr:10101--

EEPROM

EEPROM_1MBIT_ST
IC104
M24M01-HRMN6TP
A0'h
C105 0.1uF
C104 6pF OPT
C106 6pF OPT
R111 22
R112 22
EEPROM_SCL
EEPROM_SDA

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MODEL	GP3_Saturn7M	DATE	Ver. 0.1
BLOCK	FLASH/EEPROM/GPIO	SHEET	1 /

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MODEL OPTION

PIN NAME	PIN NO.	LOW	HIGH
MODEL_OPT_0	G19	NO FRC	FRC_HW_OPT
MODEL_OPT_4	E18	50/60Hz LVDS	100/120Hz LVDS
MODEL_OPT_1	C5	PHM_OFF	PHM_ON
MODEL_OPT_2	F7	2D	3D
MODEL_OPT_3	B6	HD	FHD
MODEL_OPT_5	D18	Ready	default
MODEL_OPT_6	F9	LCD	OLED

--> This option is only applied in EU.
In case of NON_EU, default value set LOW.

-->In case of GP2, This port was used for GIP/NON_GIP

--> MODEL_OPT_5, MODEL_OPT_6
: Only 3D_SG GPIO OUTPUT CONTROL

	OPT_0	OPT_4
NO_FRC	: LOW	LOW
U3_INTERNAL	: HIGH	LOW
U5_EXTERNALBOOT	:HIGH	HIGH
reserved for FRC	: LOW	HIGH

VDDC 1.26V

+1.26V_VDDC → +1.26V_VDDC
VDDC : 2026mA

Normal Power 3.3V

+3.3V_Normal, VDD33
VDD33_T/VDDP/U3_VD33_2:47mA
AVDD_MEMPLL:24mA
AU33:31mA
FRC_LPLL:13mA
FRC_MPLL:4mA
VDD33_DVI:163mA
AVDD_DMPLL
AVDD_DMPLL/AVDD_NODIE:7.362mA

Normal 2.5V

+2.5V_Normal, AVDD2P5
AVDD2P5/ADC2P5:162mA
AU25:10mA
AVDD25_PGA:13mA

DDR3 1.5V

+1.5V_DDR
AVDD_DDR0:55mA
AVDD_DDR1:55mA
MVREF

RSDS Power OPT

+1.26V_VDDC
MIU0VDDC
MIU1VDDC

S7M-PLUS_DivX_MS10 IC101 LGE107DC-RP [S7M+ DIVX/MS10]

HDMI: CK+_HDMI1, CK-_HDMI1, D0+_HDMI1, D0-_HDMI1, D1+_HDMI1, D1-_HDMI1, D2+_HDMI1, D2-_HDMI1, DDC_SDA_1, DDC_SCL_1, HPD1, CK+_HDMI2, CK-_HDMI2, D0+_HDMI2, D0-_HDMI2, D1+_HDMI2, D1-_HDMI2, D2+_HDMI2, D2-_HDMI2, DDC_SDA_2, DDC_SCL_2, HPD2, CK+_HDMI4, CK-_HDMI4, D0+_HDMI4, D0-_HDMI4, D1+_HDMI4, D1-_HDMI4, D2+_HDMI4, D2-_HDMI4, DDC_SDA_4, DDC_SCL_4, HPD4

DSUB: DSUB_HSYNC, DSUB_VSYNC, DSUB_R+, DSUB_G+, DSUB_B+

SCART1_RGB/COMP1: SC1_ID, SC1_FB, SC1_R+/COMP1_Pr+, SC1_G+/COMP1_Y+, SC1_B+/COMP1_Pb+, SC1_SOG_IN

COMP2: COMP2_Pr+, COMP2_Y+, COMP2_Pb+

CVBS In/OUT: TU_CVBS, SC1_CVBS_IN, Delete CHB_CVBS_IN, AV_CVBS_IN2, DTV/MNT_VOUT

PI_SDA, PI_SCL, CEC_REMOTE_S7

Close to MSTAR

AV_CVBS_IN2 → TP211

S7M-PLUS_DivX_MS10 IC101 LGE107DC-RP [S7M+ DIVX/MS10]

Close to MSTAR: R288 100, R289 100, C257 0.1uF, C258 0.1uF, IF_P_MSTAR, IF_N_MSTAR, C250 0.1uF, R4002 47, C251 0.1uF, R4003 47, TU_SIF

ANALOG SIF Close to MSTAR: C2014 1000pF OPT

DTV_IF

VIFP, VIFM ← TP201, TP202
IP, IM
SSIF/SIFP, SSIF/SIFM
QP, QM ← TP203, TP204
IFAGC, RF_TAGC ← TP205
TGPIO0/UPGAIN, TGPIO1/DNGAIN, TGPIO2/I2C_CLK, TGPIO3/I2C_SDA
XTALIN, XTALOUT

+3.3V_Normal, L227 BLM18PG121SN1D, C4064 0.1uF, R4019 1K

Close to MSTAR: R4020 10K, C4065 0.022uF 16V, IF_AGC_MAIN

TU/DEMOD_I2C: AMP_SCL, AMP_SDA, FULL_NIM R291 22, FULL_NIM R292 22, DEMOD_SCL, DEMOD_SDA, TU_SCL, TU_SDA

X201 24MHz, C261 27pF, C262 27pF, R287 1M

SPDIF_IN/GPIO177, SPDIF_OUT/GPIO178 ← LED_DRIVER_D/L_SDA, SPDIF_OUT

B/T USB: DM_P0, DP_P0

SIDE USB: DM_P1, DP_P1 ← SIDE_USB_DM, SIDE_USB_DP

I2S_IN_BCK/GPIO175, I2S_IN_SD/GPIO176, I2S_IN_WS/GPIO174 ← NEC_SDA, COMP2_DET, NEC_SCL

I2S_I/F: I2S_OUT_BCK/GPIO181, I2S_OUT_MCK/GPIO179, I2S_OUT_SD/GPIO182, I2S_OUT_SD1/GPIO183, I2S_OUT_SD2/GPIO184, I2S_OUT_SD3/GPIO185, I2S_OUT_WS/GPIO180 ← AUD_SCK, AUD_MASTER_CLK_0, AUD_LRCH, LED_DRIVER_D/L_SCL, MODEL_OPT_4, MODEL_OPT_5, AUD_LRCK

AUDIO IN: LINE_IN_0L..5R ← SC1/COMP1_L_IN, SC1/COMP1_R_IN, COMP2_L_IN, COMP2_R_IN, PC_L_IN, PC_R_IN

AUDIO OUT: LINE_OUT_0L..3R → SCART1_Lout, EXT_L_AMP, SCART1_Rout, EXT_R_AMP

MIC_DET_IN, MICCM, MICIN

AUCOM, VRM, VAG, VRP

H/P OUT: CM2012F5R6KT, HP_OUT_1L, HP_OUT_1R → HP_LOUT, HP_ROUT

ET_RXD0, ET_TXD0, ET_RXD1, ET_TXD1, ET_REFCLK, ET_TX_EN, ET_MDC, ET_MDIO, ET_CRS

AVLINK, IRINT, TESTPIN, RESET, U3_RESET → TP206, R298 OPT 100, SOC_RESET

S7M-PLUS_DivX_MS10 IC101 LGE107DC-RP [S7M+ DIVX/MS10]

+1.26V_VDDC
MIU0VDDC, MIU1VDDC
VDD33
AVDD2P5
AU25
AVDD25_PGA
FRC_LPLL
MVREF

VDDC_1..11, A_DVDD, B_DVDD, FRC_VDDC_0..8, U3_DVDD_DDR, AVDD1P2, DVDD_NODIE, AVDD2P5_ADC_1, AVDD2P5_ADC_2, AVDD25_REF, AVDD_AU25, PVDD_1, PVDD_2, AVDD25_PGA, AVDD_DMPLL, AVDD_NODIE, AVDD_DVI_1, AVDD_DVI_2, AVDD3P3_CVBS, AVDD_AU33, AVDD_EAR33, AVDD33_T, VDDP_1..3, FRC_VD33_2_1, FRC_VD33_2_2, FRC_AVDD_RSDS_1..3, FRC_AVDD, FRC_AVDD_LPLL, FRC_AVDD_MPLL, FRC_VDD33_DDR, AVDD_MEMPLL, FRC_AVDD_MEMPLL, AVDD_DDR0_D_1..4, AVDD_DDR0_C, AVDD_DDR1_D_1..4, AVDD_DDR1_C, FRC_AVDD_DDR_D_1..4, FRC_AVDD_DDR_C, MVREF, NC_1, NC_2

GND_1..GND_FU, PGA_VCOM

U9 BLM18SG121TN1D, L223

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MODEL	GP2R	DATE	20101023
BLOCK	MAIN2, HW OPT	SHEET	2 /

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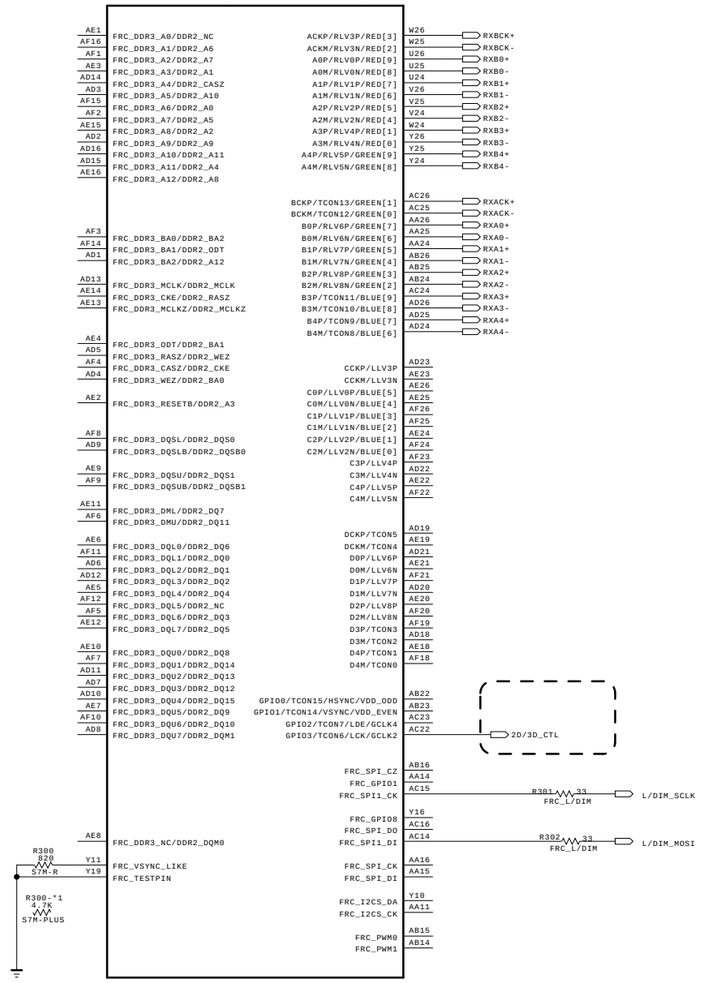
S7M-PLUS_DivX_MS10

IC101
LGE107DC-RP [S7M+ DIVX/MS10]



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MODEL	GP2R	DATE	20101023
BLOCK	FRC_DDR	SHEET	3

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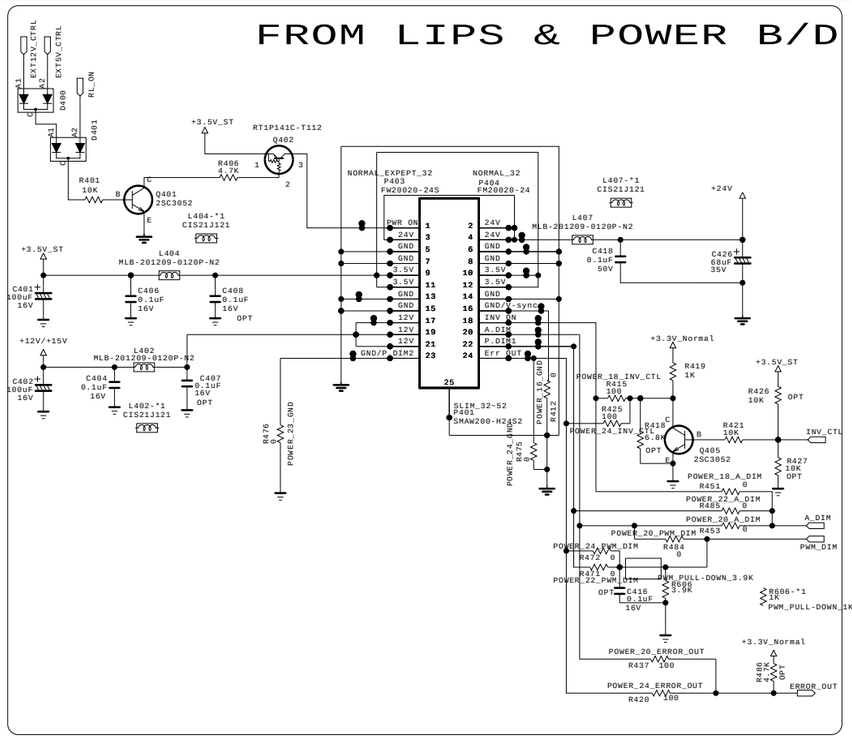

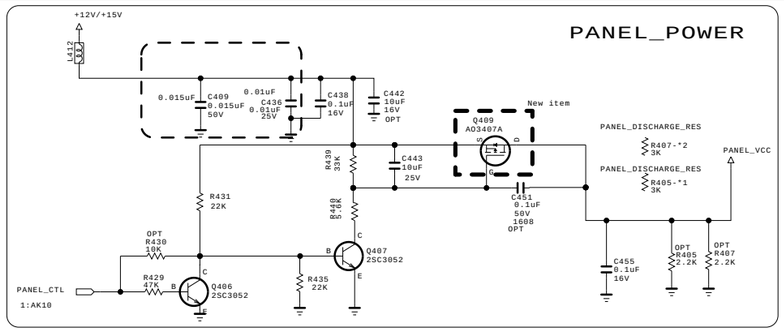

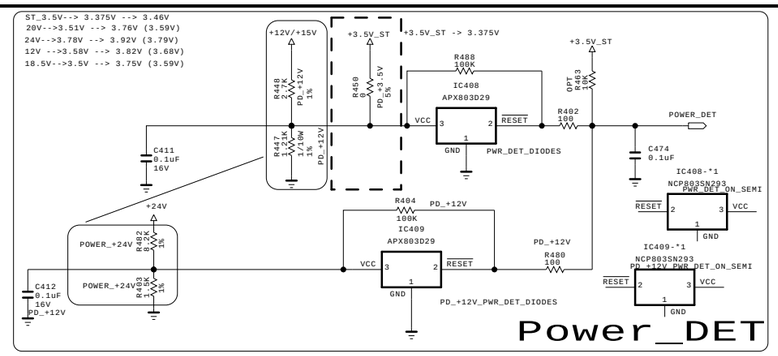

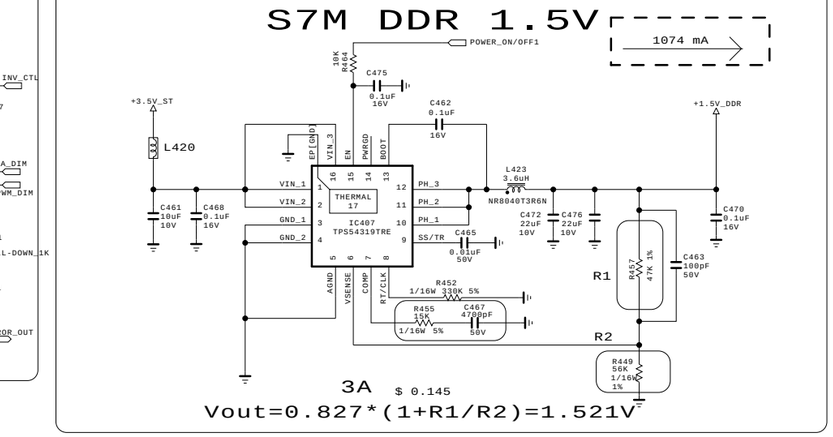

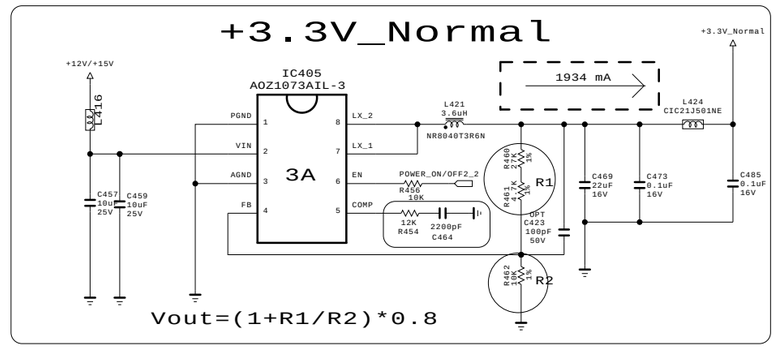

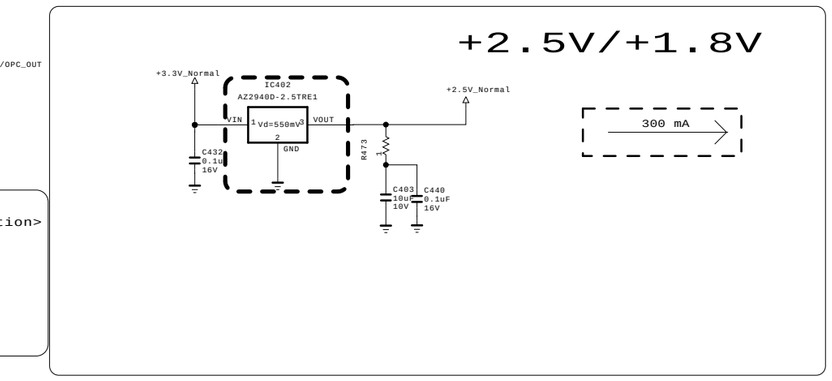

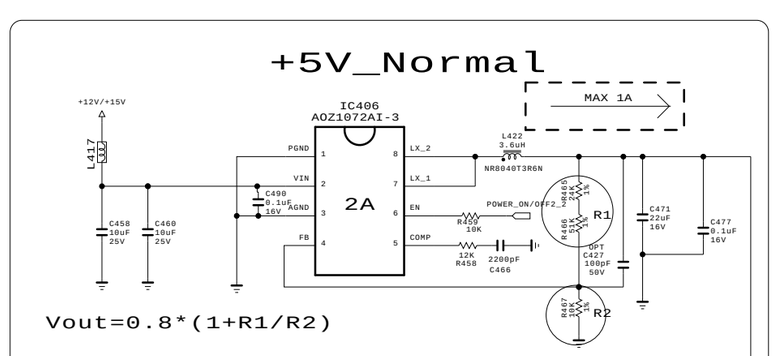

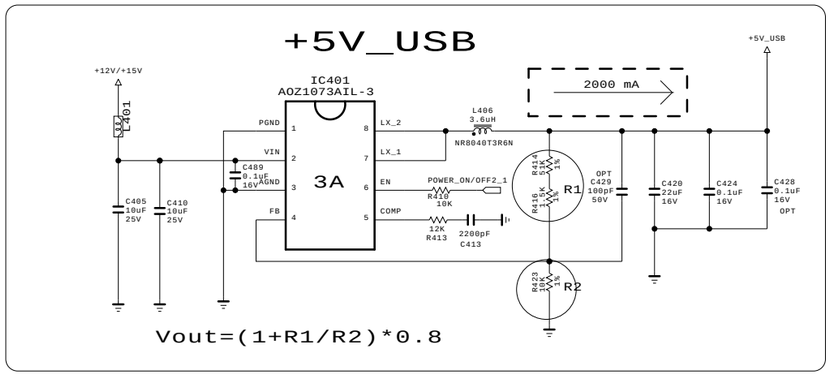

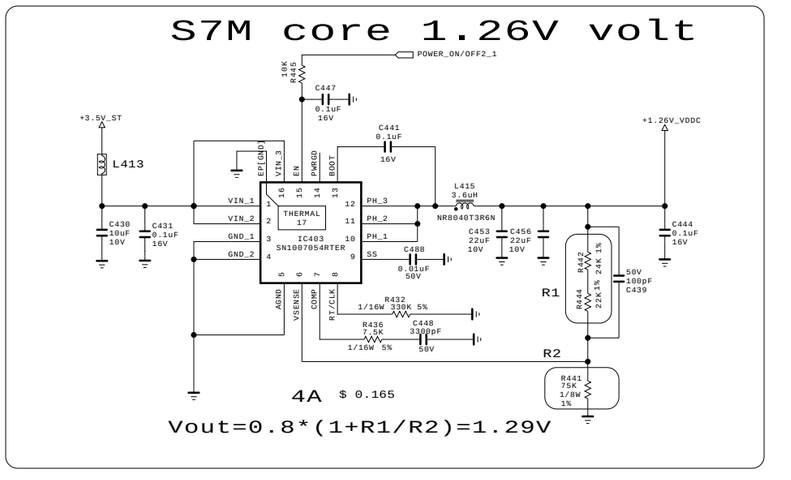

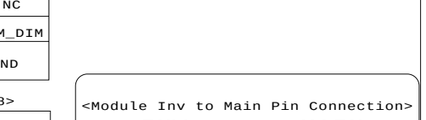

<MODULE PIN MAP>

PIN No	LGD(PSU) or LIPS	CMO10"Lamp (PSU)	AUO 10"Lamp (PSU)	SHARP (PSU)	IPS-@ (PSU)
16	GND	GND	GND	GND	GND
18	INV_ON	A-DIM	INV_ON	INV_ON	INV_ON
20	VBR-A	NC	Err_out	52/60:ERROR 26/32HD:NC	Err_out
22	PWM_DIM	PWM_DIM	NC	26/32/52:PWM 60:NC	NC
24	Err_out	INV_ON	PWM_DIM	26/32/52:GND 60:PWM	PWM_DIM
23	GND	GND	GND	GND	GND

<LED MODULE PIN MAP -> latest update 20100618>

PIN No	LGD LPB/ OS LPB	32LE5300-TA CMO10"LED (PSU)	32LE4500-TA AUO 10"LED (PSU)	32LE5300-TA LGD 10"LED (PSU)	
16	NC	NC	NC	NC	
18	INV_ON	INV_ON	INV_ON	INV_ON	
20	NC	err_out --> NC	err_out --> NC	NC	
22	PWM_DIM	NC	NC	PWM_DIM	
24	err_out --> NC	PWM_DIM	PWM_DIM	err_out --> NC	
23	NC	NC	NC	NC	

LGD edge led error-out use or not? checking is necessary...

<Module Inv to Main Pin Connection>

INV	<-->	MAIN
#11	<-->	#24
#12	<-->	#18
#13	<-->	#20
#14	<-->	#22

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MODEL	GP2R	DATE	20101023
BLOCK	POWER_LARGE	SHEET	4

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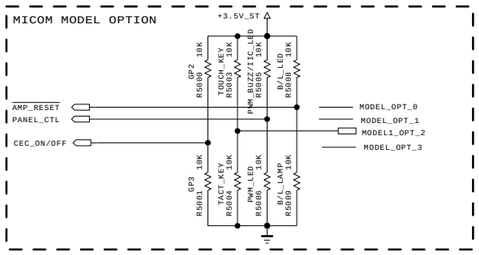
MICOM MODEL OPTION

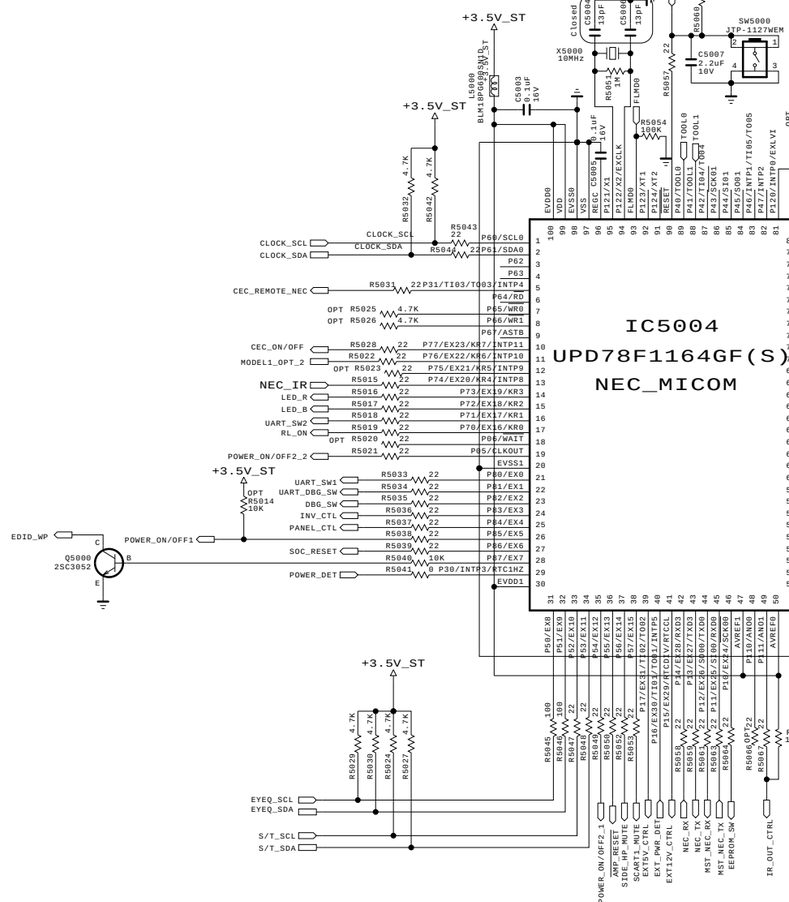


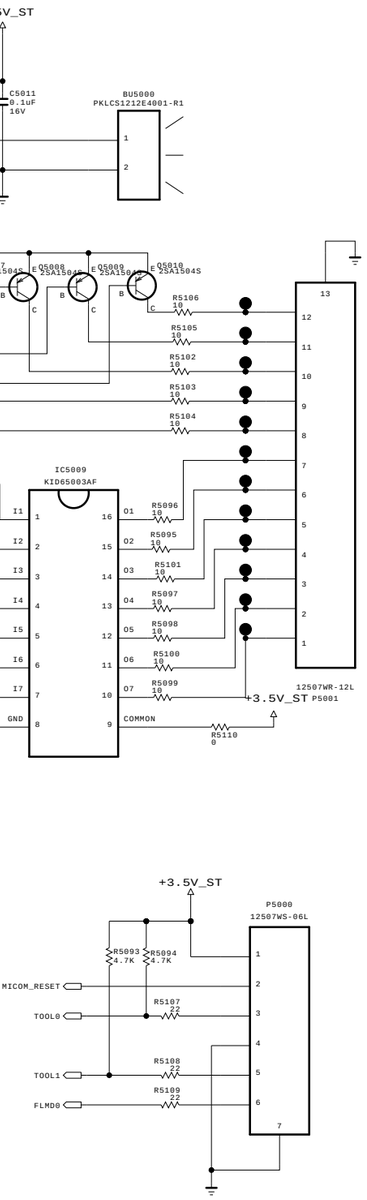
MODEL OPTION

PIN NAME	PIN NO.	HIGH	LOW
MODEL_OPT_0	8	B/L_LED	B/L_LAMP
MODEL_OPT_1	11	PWM_BUZZ/IIC_LED	PWM_LED
MODEL_OPT_2	30	TOUCH_KEY	TACT_KEY
MODEL_OPT_3	31	GP2	GP3

MODEL_OPT_0	MODEL_OPT_1	MODEL_OPT_2	MODEL_OPT_3	
LOW	LOW	LOW	LOW	LD350/450/550
HIGH	LOW	HIGH	LOW	19/22/26LE3300(5500)
HIGH	HIGH	HIGH	LOW	32/37/42/47/55LE5300(10)
LOW	HIGH	LOW	LOW	LD420
HIGH	HIGH	LOW	LOW	LE7300
	HIGH		HIGH	TBD

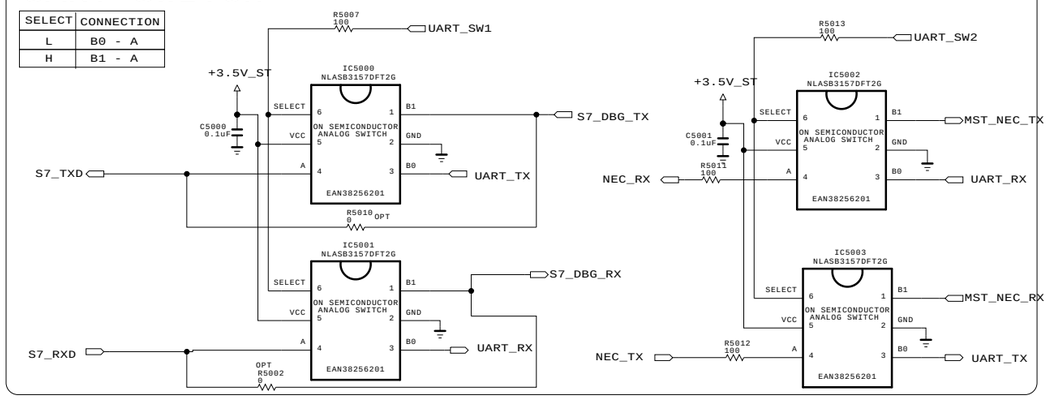
IC5004 UPD78F1164GF(S) NEC_MICOM



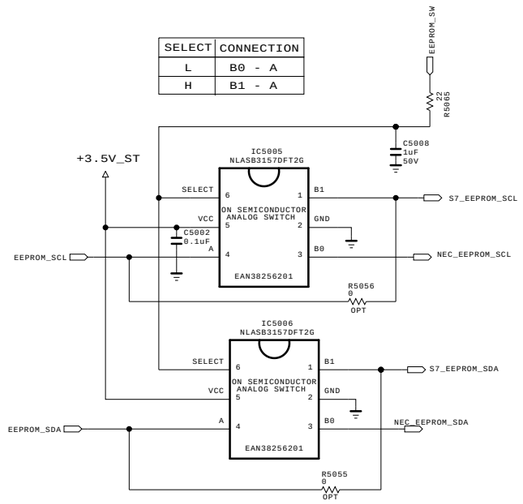


UART SWITCH

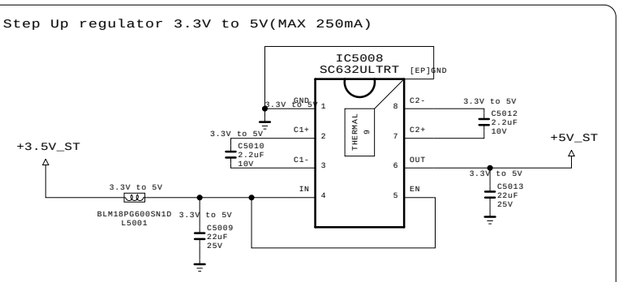
SELECT	CONNECTION
L	B0 - A
H	B1 - A



SELECT	CONNECTION
L	B0 - A
H	B1 - A



Step Up regulator 3.3V to 5V(MAX 250mA)



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MODEL	GP2R	DATE	20101023
BLOCK	MICOM	SHEET	5

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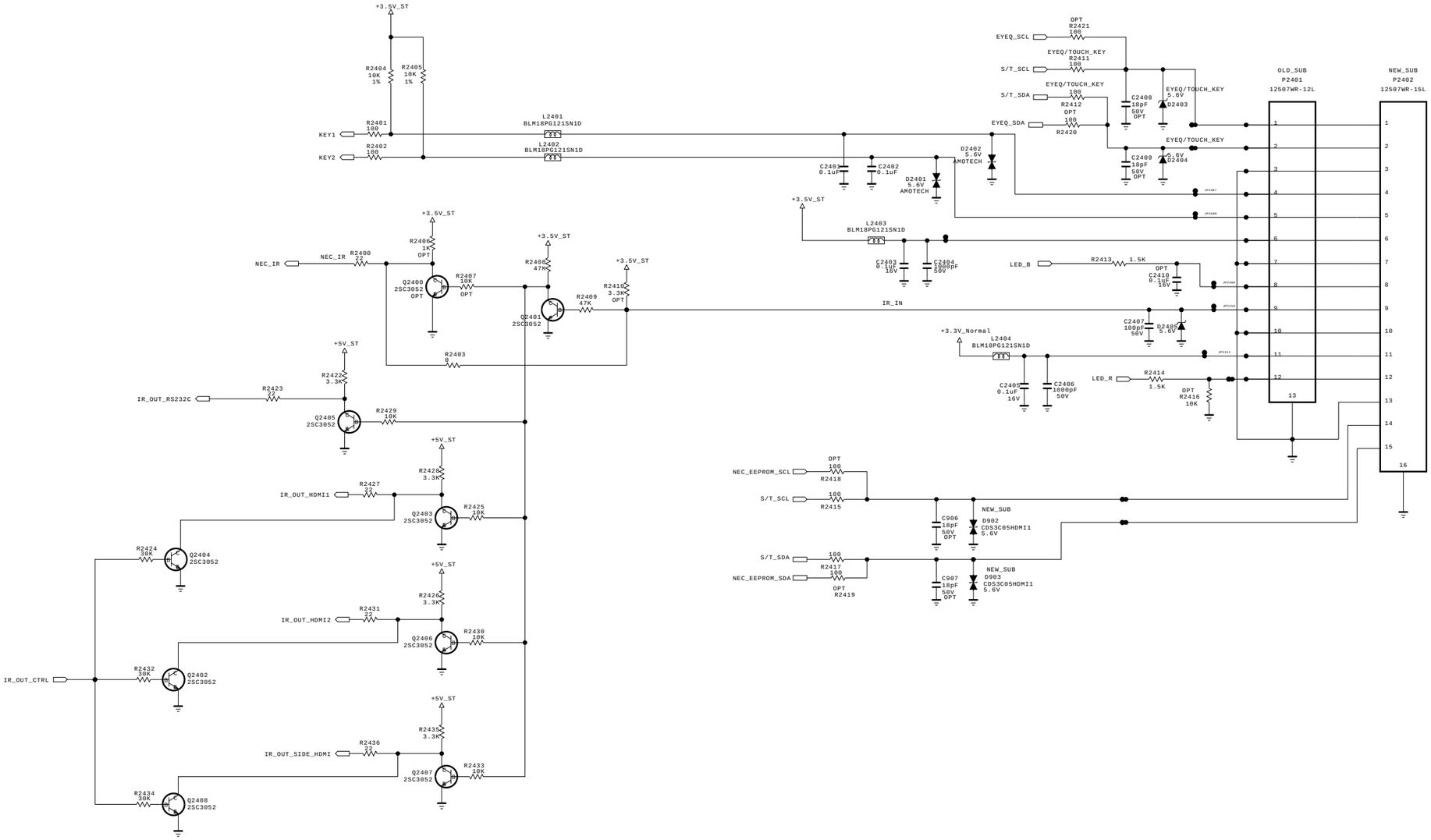
CONTROL
IR & LED



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MODEL	GP2R	DATE	20101023
BLOCK	IR/CONTROL-L	SHEET	6

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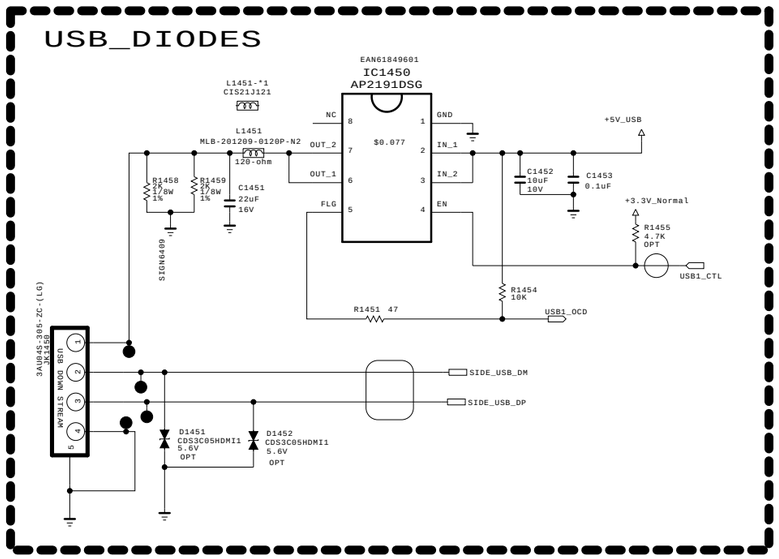
USB_DIODES



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MODEL	GP2R	DATE	20101023
BLOCK	USB_OCP_DIODE	SHEET	7 /

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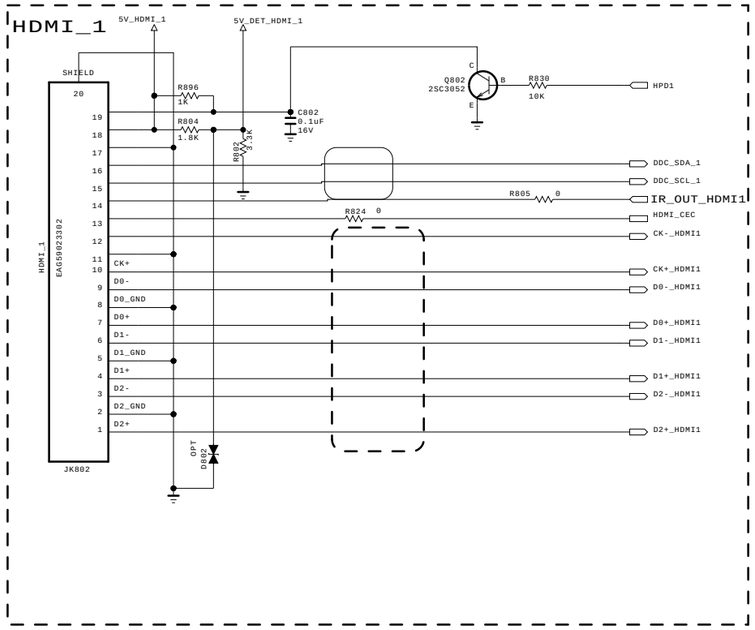
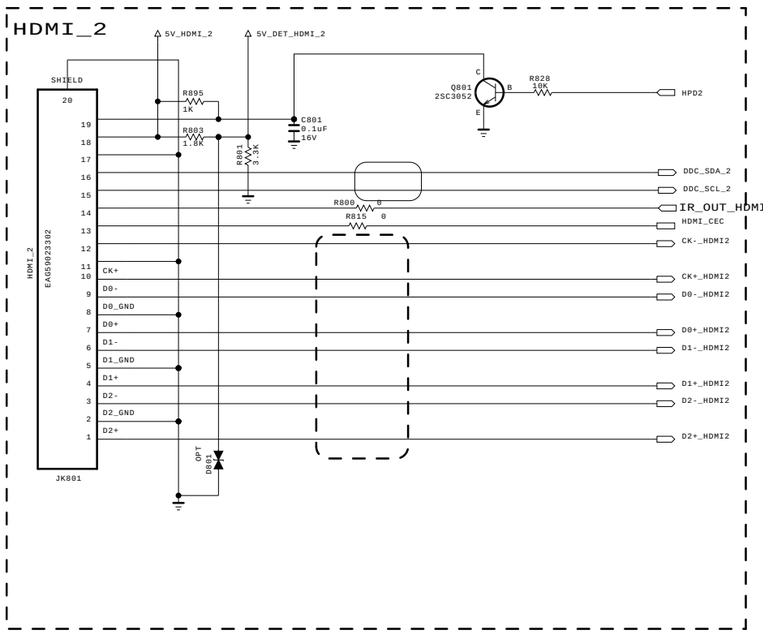
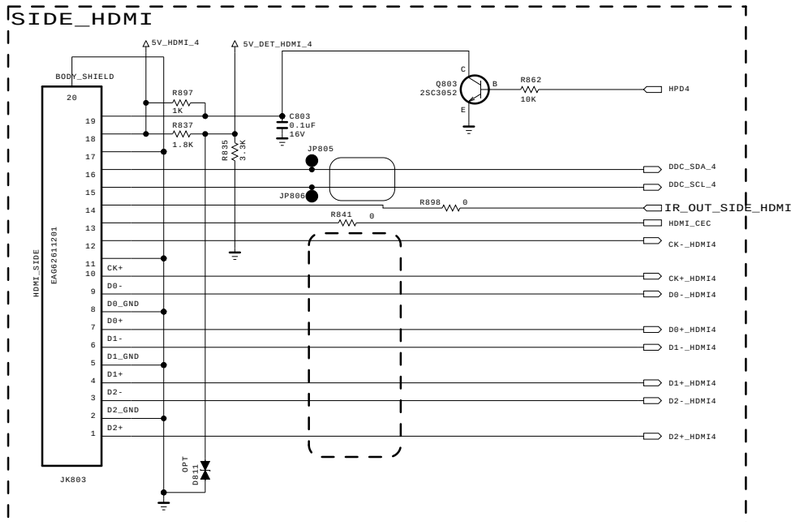
HDMI_1



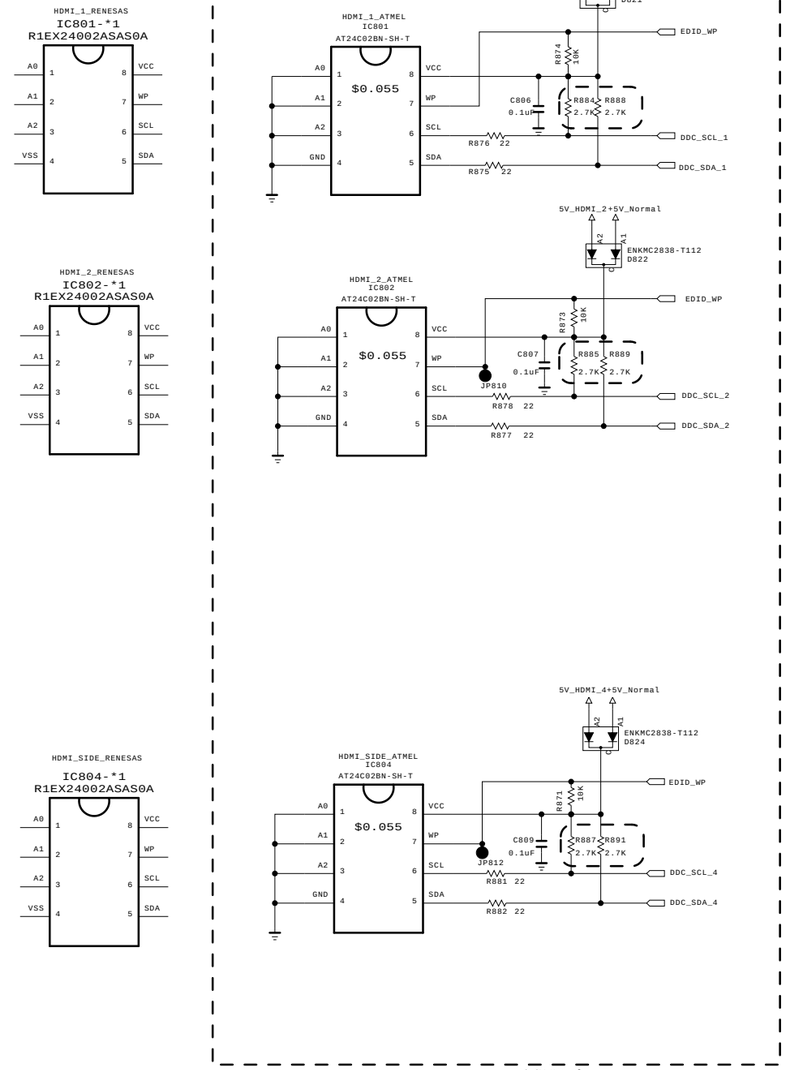
HDMI_2



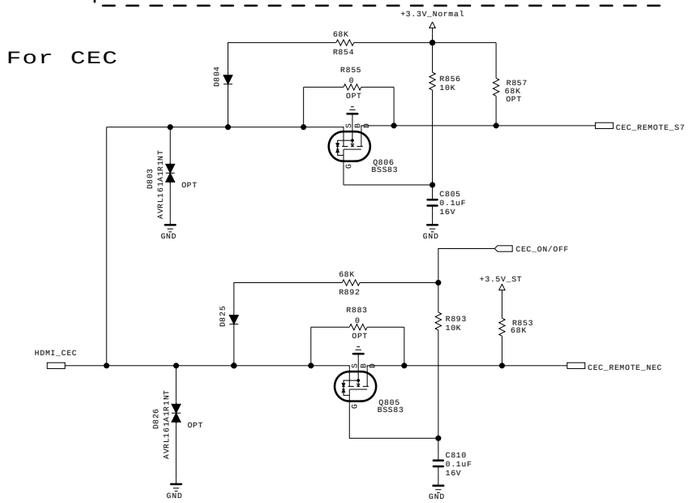
SIDE_HDMI



HDMI EEPROM



For CEC



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MODEL	GP2R	DATE	20101023
BLOCK	HDMI	SHEET	8

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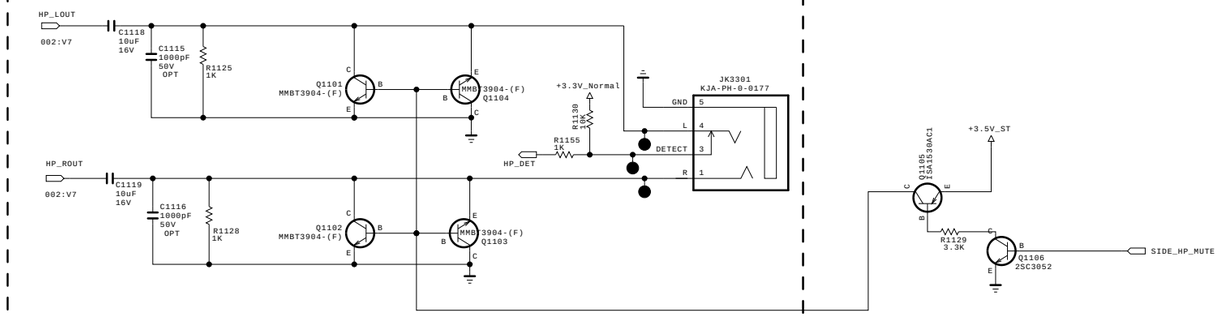
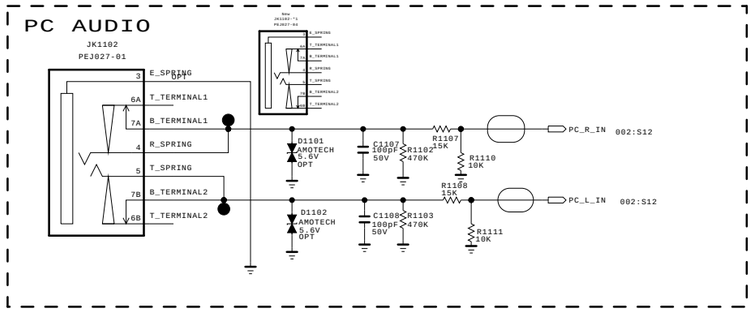
RGB/SPDIF/PC/HP

New Item Development

EARPHONE BLOCK

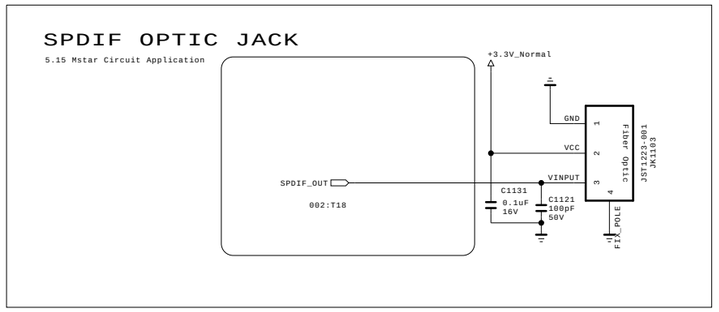


PC AUDIO

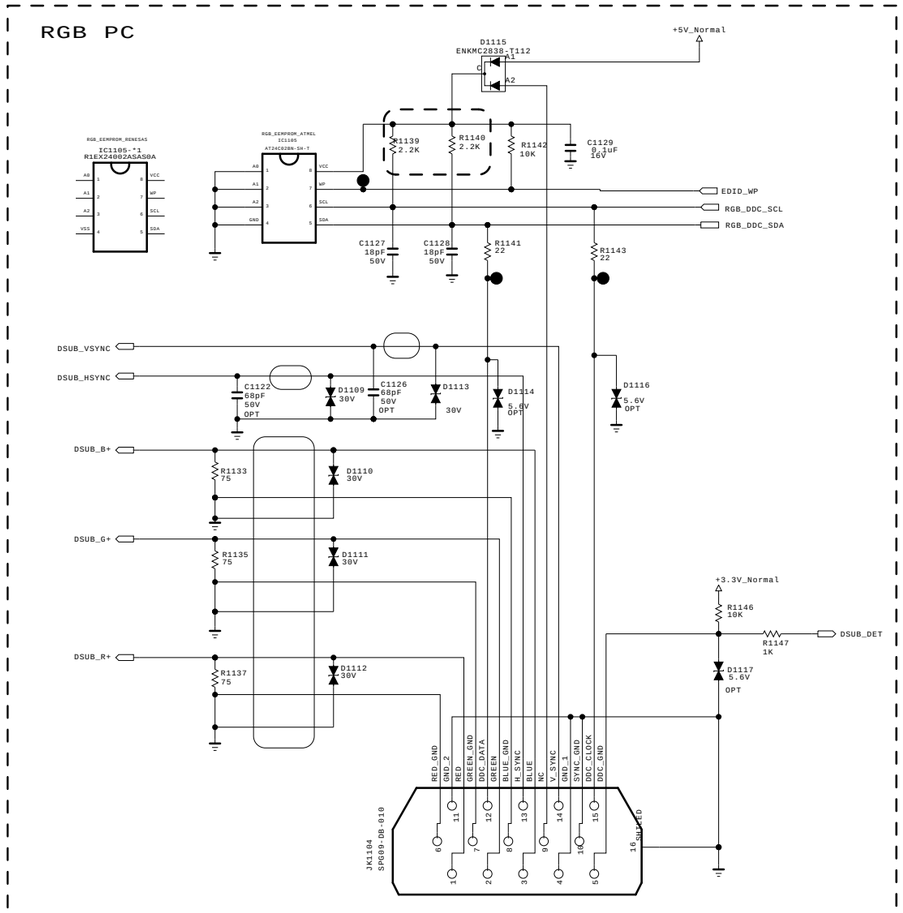


SPDIF OPTIC JACK

5.15 Mstar Circuit Application



RGB PC



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MODEL	GP2R	DATE	20101023
BLOCK	RGB/SPDIF/HP	SHEET	9

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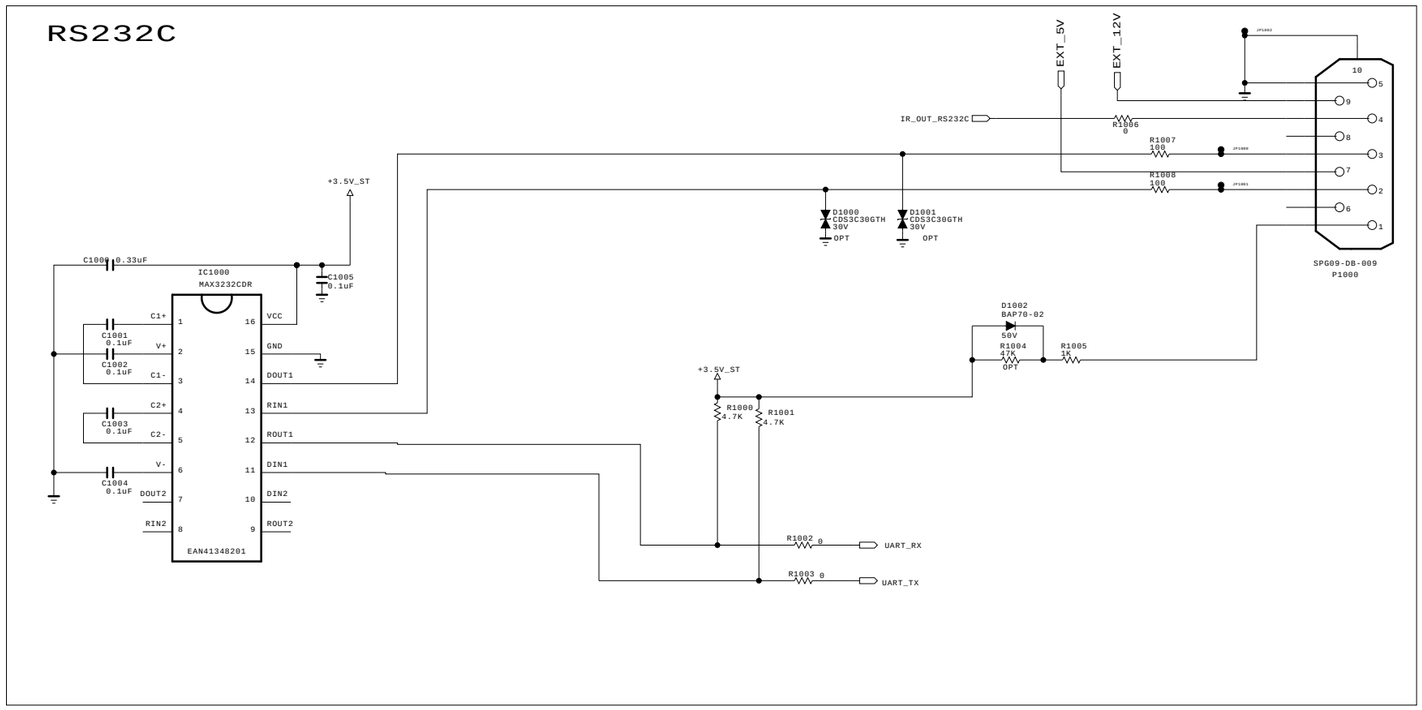
RS232C



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MODEL	GP2R	DATE	20101023
BLOCK	RS232C_9PIN	SHEET	10 /

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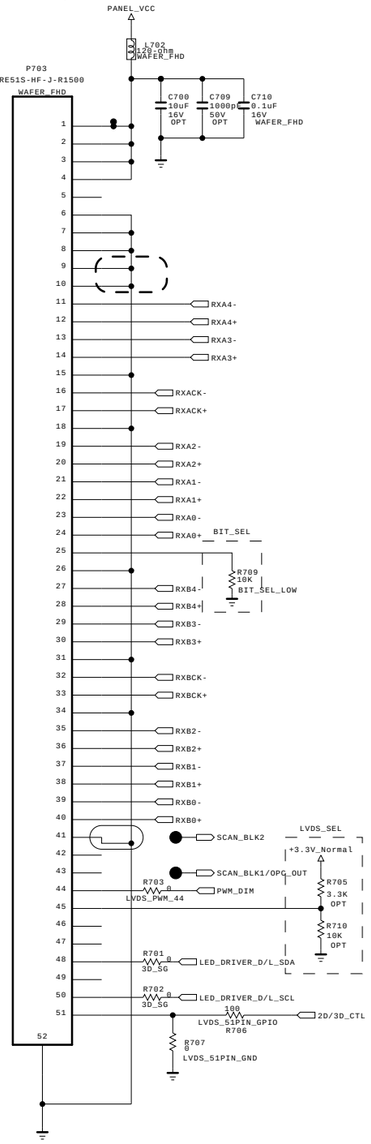
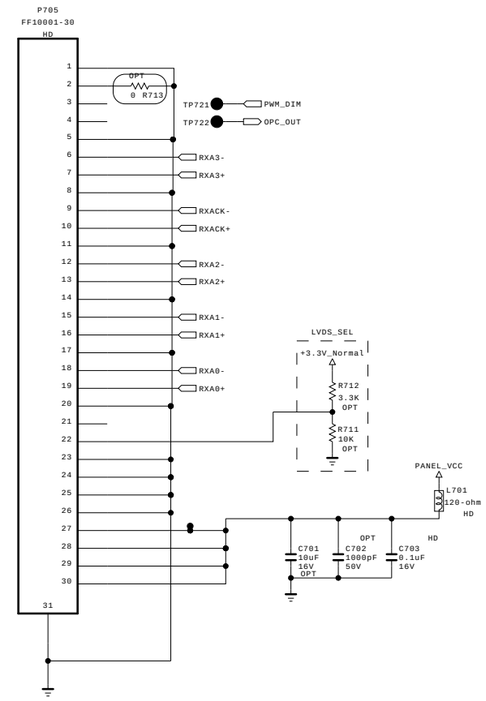
[51Pin LVDS Connector]
(For FHD 60/120Hz)



[30Pin LVDS Connector]
(For HD 60Hz_Normal)



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MODEL	GP2R	DATE	20101023
BLOCK	LVDS_LARGE	SHEET	11

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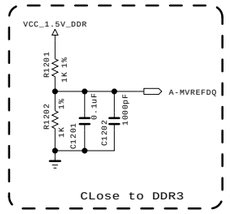
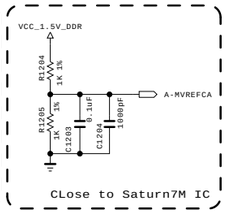
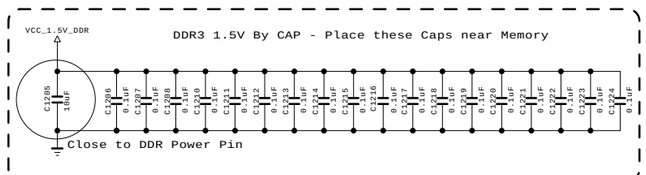
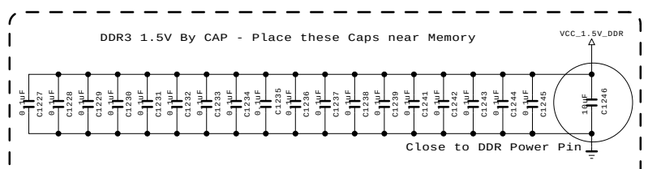
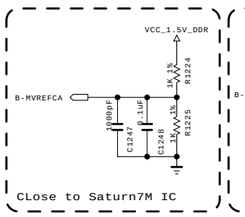
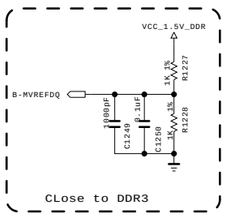


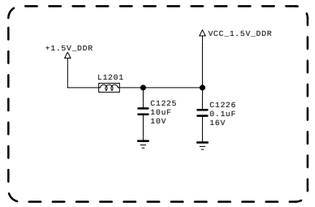






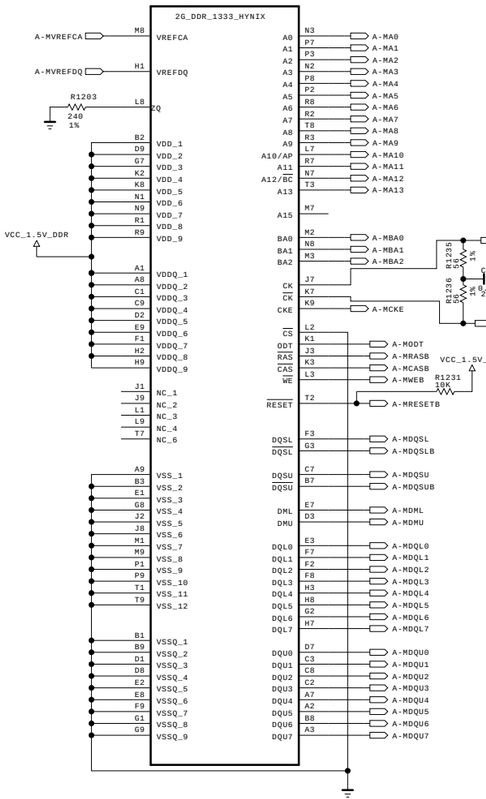


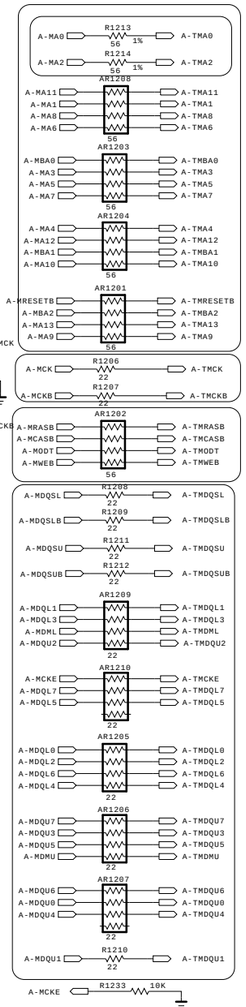




EAN61570701

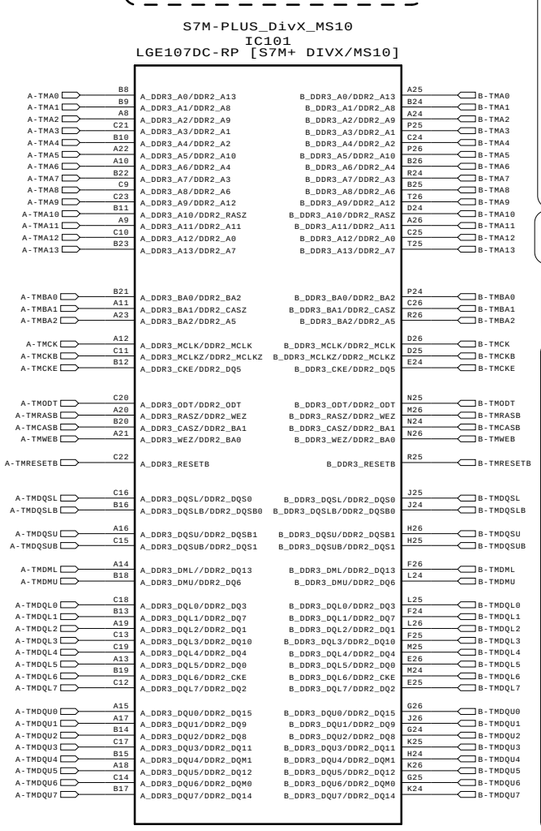
IC1201 H5TQ2G63BFR-H9C

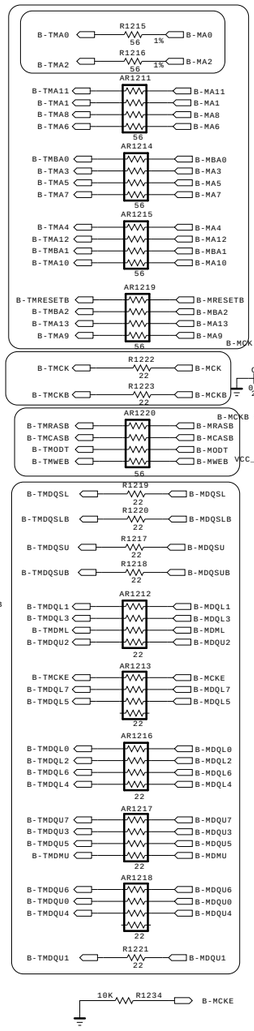




S7M-PLUS_DivX_MS10

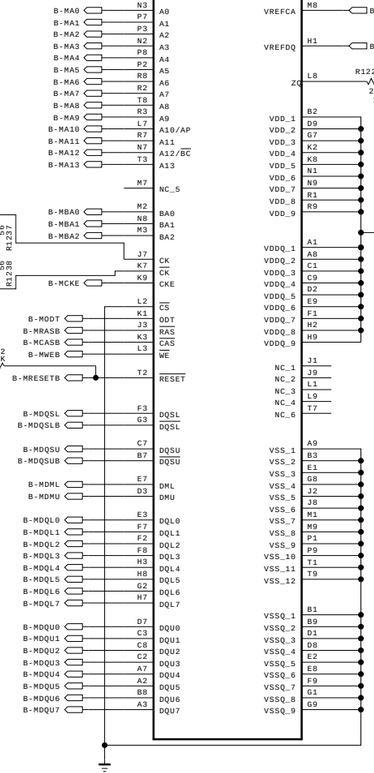
IC101 LGE107DC-RP [S7M+ DIVX/MS10]

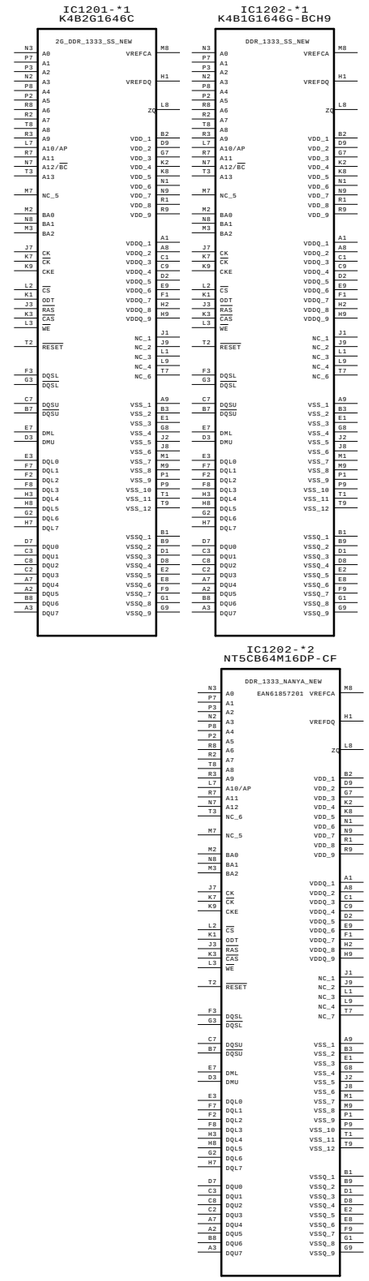


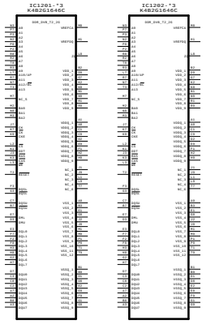


EAN61828901

IC1202 H5TQ1G63DFR-H9C







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MODEL	GP2R	DATE	20101023
BLOCK	DDR_256	SHEET	12 /

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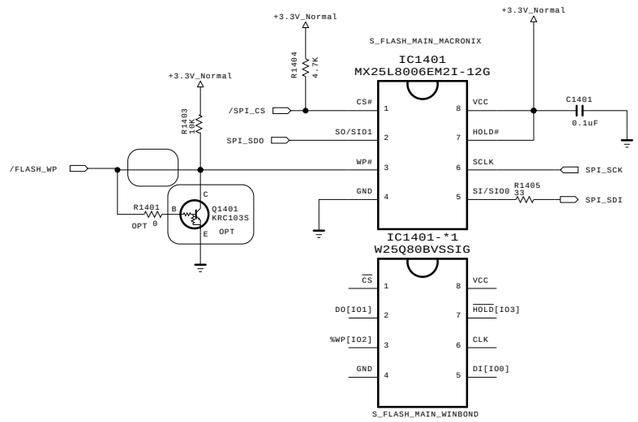

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MODEL	GP2R	DATE	20101023
BLOCK	SFLASH_1MB	SHEET	13 /

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GP2R_LARGE_TUNER

TU3702
TDTJ-S001D

DVB_1INPUT_H_LGIT

1	ANT_PWR[OPT]
2	BST_CNTL
3	+B
4	NC[RF_AGC]
5	AS
6	SCL
7	SDA
8	NC[IF_TP]
9	SIF
10	NC
11	VIDEO
12	GND
13	1.2V
14	3.3V
15	RESET
16	IF_AGC_CNTL
17	DIF_1
18	DIF_2
19	SHIELD

CN_2INPUT_H_LG3911

TU3701
TDFR-C036D

1	RF_S/W_CNTL
2	BST_CNTL
3	+B1[+5V]
4	NC[RF_AGC]
5	NC_1
6	SCLT
7	SDAT
8	NC_2
9	SIF
10	NC_3
11	VIDEO
12	GND
13	+B2[1.2V]
14	+B3[3.3V]
15	RESET
16	NC_4
17	SCL
18	SDA
19	ERR
20	SYNC
21	VALID
22	MCL
23	D0
24	D1
25	D2
26	D3
27	D4
28	D5
29	D6
30	D7
31	SHIELD

RF_SWITCH_CTL
Pull-up can't be applied because of MODEL_OPT_2

close to TUNER
OPT R3762 0 CONTROL_ATTEN

close to TUNER
R3705 0 RF_SW_OPT
C3701 0.1uF 16V
C3703 100pF 50V
C3704 0.1uF 16V
+5V_TU

OPTION : RF AGC
C3728 0.1uF 16V OPT
C3731 10uF 10V OPT
Q3704 2SC3052 OPT
R3754 10K OPT
FE_AGC_SPEED_CTL
IF_AGC_SEL

GPIO must be added.

R3707 0 OPT
C3706 0.1uF 16V

close to TUNER
C3702 0.1uF 16V

+1.2V/+1.8V_TU
FULL_NIM
C3737 100pF 50V
C3738 0.1uF 16V
C3705 100uF 16V
close to the tuner pin, add,09029
CN C3739 10uF 6.3V
C3707 100pF 50V
C3708 0.1uF 16V
+3.3V_TU

R3732 100
R3733 180K
C3710 0.1uF 16V
TUNER_RESET

C3711-*1 20pF 50V TU_I2C_FILTER
C3713-*1 20pF 50V TU_I2C_FILTER
TU_I2C_FILTER R3735-*1 COIL
TU_I2C_FILTER R3736-*1 COIL

R3704 0 HALF_NIM
IF_AGC_MAIN
should be guarded by ground

R3703 100 FULL_NIM
close to IF line

HALF_NIM R3760 0
R3761 0 HALF_NIM
IF_N_MSTAR
IF_P_MSTAR
1. should be guarded by ground
2. No via on both of them
3. Signal Width >= 12mils
Signal to Signal Width = 12mils
Ground Width >= 24mils
Close to the tuner

+5V_TU
BOOSTER : CHINA OPT
L3701 BOOSTER_OPT BLM18PG121SN1D
BOOSTER_OPT R3734 0
Q3701 BOOSTER_OPT ISA1530AC1
BOOSTER_OPT R3743 10K
R3737 2.2K
BOOSTER_OPT
Q3702 2SC3052
BOOSTER_OPT R3745 10K
FE_BOOSTER_CTL
LNA2_CTL
BOOSTER_OPT
C3709 0.01uF 25V BOOSTER_OPT
The pull-up/down of LNA2_CTL is depended on MODLE_OPT_1. GPIO must be added for FE_BOOSTER_CTL

TU_IIC_NON_ATSC_SANYO
R3740-*1 1K
+3.3V_TU
R3741-*1 1K
TU_IIC_ATSC_SANYO
R3740 1.2K
R3741 1.2K
TU_SCL
TU_SDA
33 R3735 TU_I2C_NON_FILTER
33 R3736 TU_I2C_NON_FILTER
C3713 18pF 50V
C3711 18pF 50V
C3742 20pF 50V
C3743 20pF 50V
TU_I2C_FILTER

+5V_TU
R3751 220
R3752 220
TU_CVBS
R3749 0
R3750 1K OPT
Q3703 ISA1530AC1

+5V_TU
R3755 470
R3758 0
TU_SIF
R3753 4.7K
Q3705 ISA1530AC1

DEMOD_RESET
This was being applied to the only china demod, so this has to be deleted in both main and ISDB sheet.

+3.3V_TU
R3742 4.7K FULL_NIM
R3744 4.7K FULL_NIM
DEMOD_SCL
DEMOD_SDA
C3712 22pF 50V FULL_NIM
C3714 22pF 50V FULL_NIM

HALF_NIM_1.2V_BCD
IC3703
AZ1117BH-ADJTRE1
+3.3V_TU
INPUT
ADJ/GND
OUTPUT
R2 HALF_NIM R3767 10
+1.2V/+1.8V_TU
HALF_NIM R3768 1.2K R1
IC3703-*1 AP1117EG-13
IN OUT ADJ/GND
HALF_NIM_1.2V_DIODES
Please, check multi Item! 10/12
R3703 150 OPT
HALF_NIM R3766 1 1/10W
C3748 0.1uF 16V HALF_NIM
C3741 10uF 10V HALF_NIM

IC3701
AP2132MP-2.5TRG1
+1.2V/+1.8V_TU
380mA
FULL_NIM_BCD
R3771 10K FULL_NIM_BCD
R3770 10K FULL_NIM_SEMTEK
R3769 10K FULL_NIM_BCD
PG EN VIN VCTRL GND ADJ VOUT NC
THERMAL PAD 9
R3748-*1 10K
FULL_NIM_SEMTEK R3748 5.1K R1
R3747 9.1K 1005 R2
Vo=0.8*(1+R1/R2)
R3764 0 1/10W FULL_NIM
C3729 0.1uF 16V FULL_NIM
C3730 10uF 10V FULL_NIM
C3717 0.1uF 16V
+5V_Normal
FULL_NIM_BCD L3704

IC3701-*1
SC4215ISTRT
NC_1 EN VIN NC_2 GND ADJ VO NC_3
FULL_NIM_SEMTEK

FULL_NIM R3724 0 FE_TS_SYNC
FULL_NIM R3730 0 FE_TS_VAL_ERR
FULL_NIM R3731 0 FE_TS_CLK
FULL_NIM_CHINA R3725 0 FE_TS_DATA[0]
FULL_NIM R3727 0 FE_TS_DATA[1]
FULL_NIM R3728 0 FE_TS_DATA[2]
FULL_NIM R3729 0 FE_TS_DATA[3]
FULL_NIM R3726 0 FE_TS_DATA[4]
FULL_NIM R3721 0 FE_TS_DATA[5]
FULL_NIM R3722 0 FE_TS_DATA[6]
FULL_NIM_CHINA R3723 0 FE_TS_DATA[7]
FE_TS_DATA[0-7]
Close to the CI Slot
R3706 0 FULL_NIM_BR

+5V_TUNER
+5V_TU
200mA
Size change L3702
MLB-201209-0120P-N2
C3719 22uF 10V
C3724 0.1uF 16V
C3722 22uF 16V
C3726 0.1uF 16V
location movement,0929
+3.3V_TU
60mA
+3.3V_Normal
Size change L3703
MLB-201209-0120P-N2
C3723 22uF 10V
C3725 0.1uF 16V
C3715 22uF 10V
C3727 0.1uF 16V
Add,0929

TUNER MULTI-OPTION

TU3702-*1 TDVJ-H101F
TU3702-*3 UDA5SAL
GP3_ATSC_1INPUT_H_SANYO
GP3_ATSC_1INPUT_H_LGIT

NTSC_2INPUT_H_LGIT
TU3702-*2
TDTR-T036F
GP2R_AU_1INPUT_H_LGIT
TU3702-*4 TDTJ-S101D

TU3701-*2 TDFR-B035F
TU3701-*4 TDFR-C236D

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MODEL	GP2R	DATE	20101023
BLOCK	TUNER_L	SHEET	14

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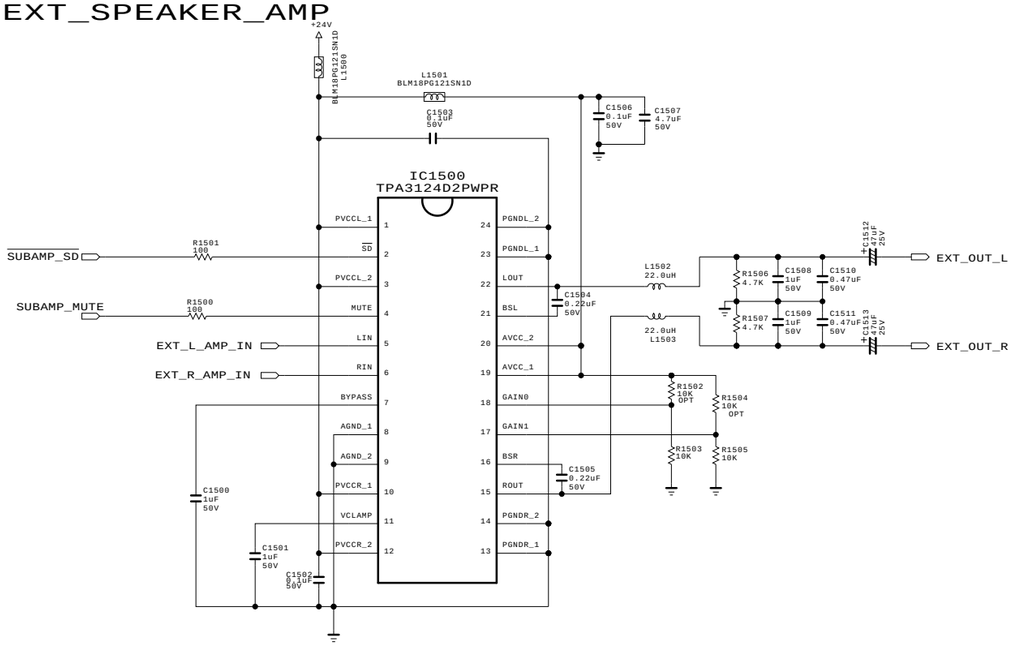
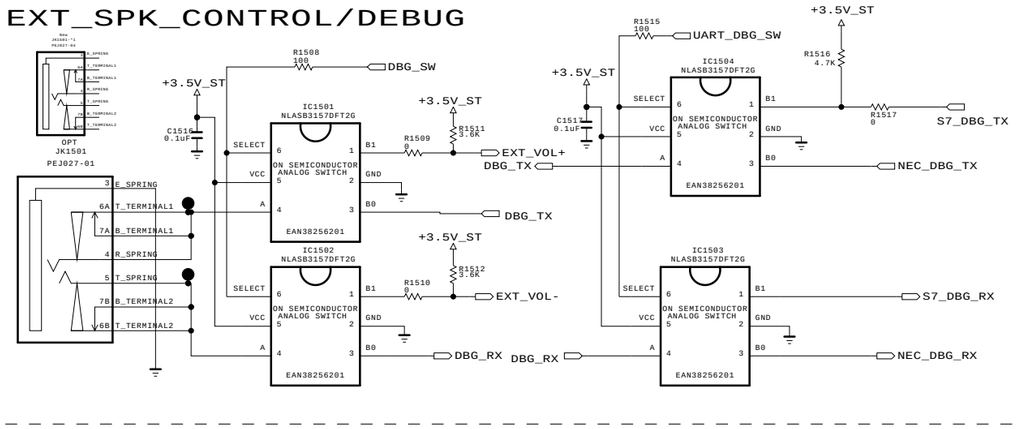
EXT_SPEAKER_AMP



EXT_SPK_CONTROL/DEBUG



EXT_SPEAKER

EXT_SPEAKER_MUTE

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MODEL		DATE	
BLOCK		SHEET	/

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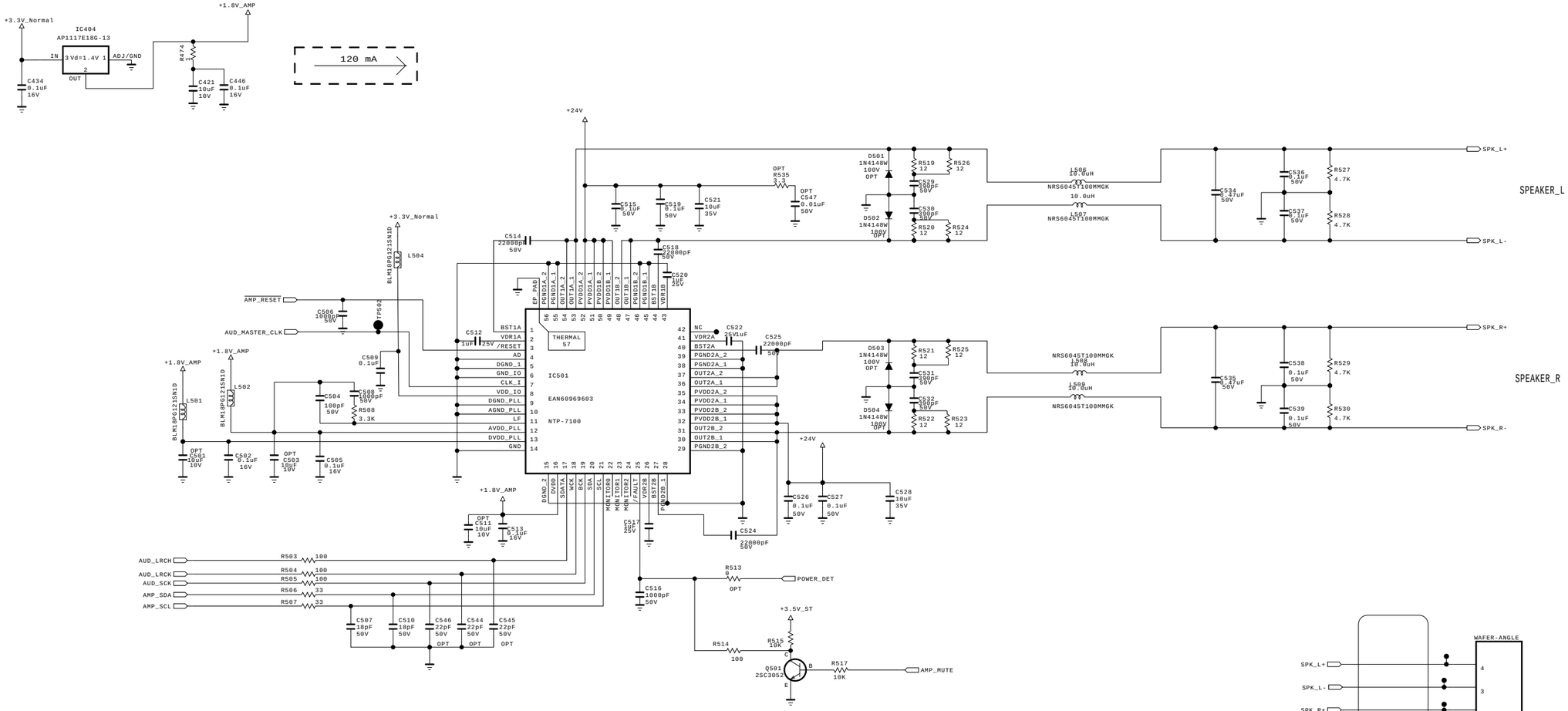

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MODEL	GP2R	DATE	20101023
BLOCK	AMP_NTP	SHEET	16 /

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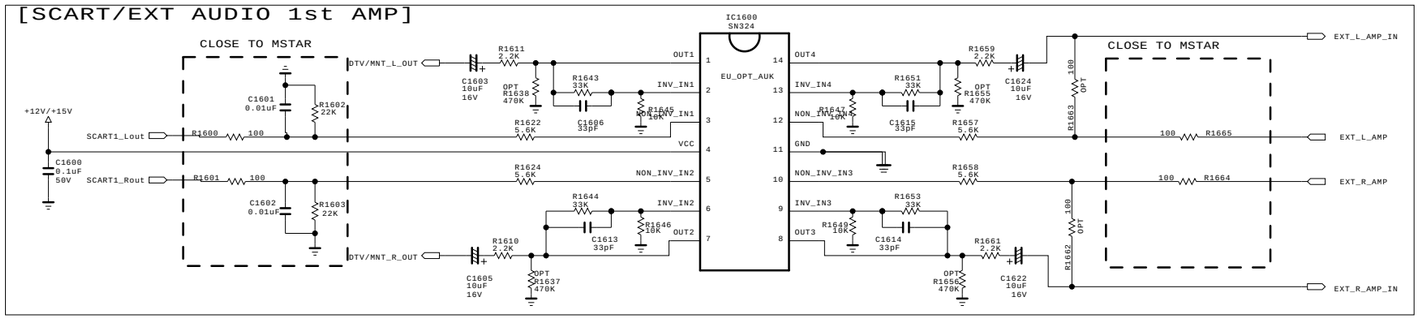
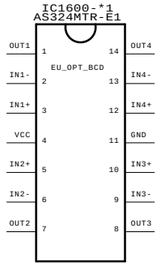
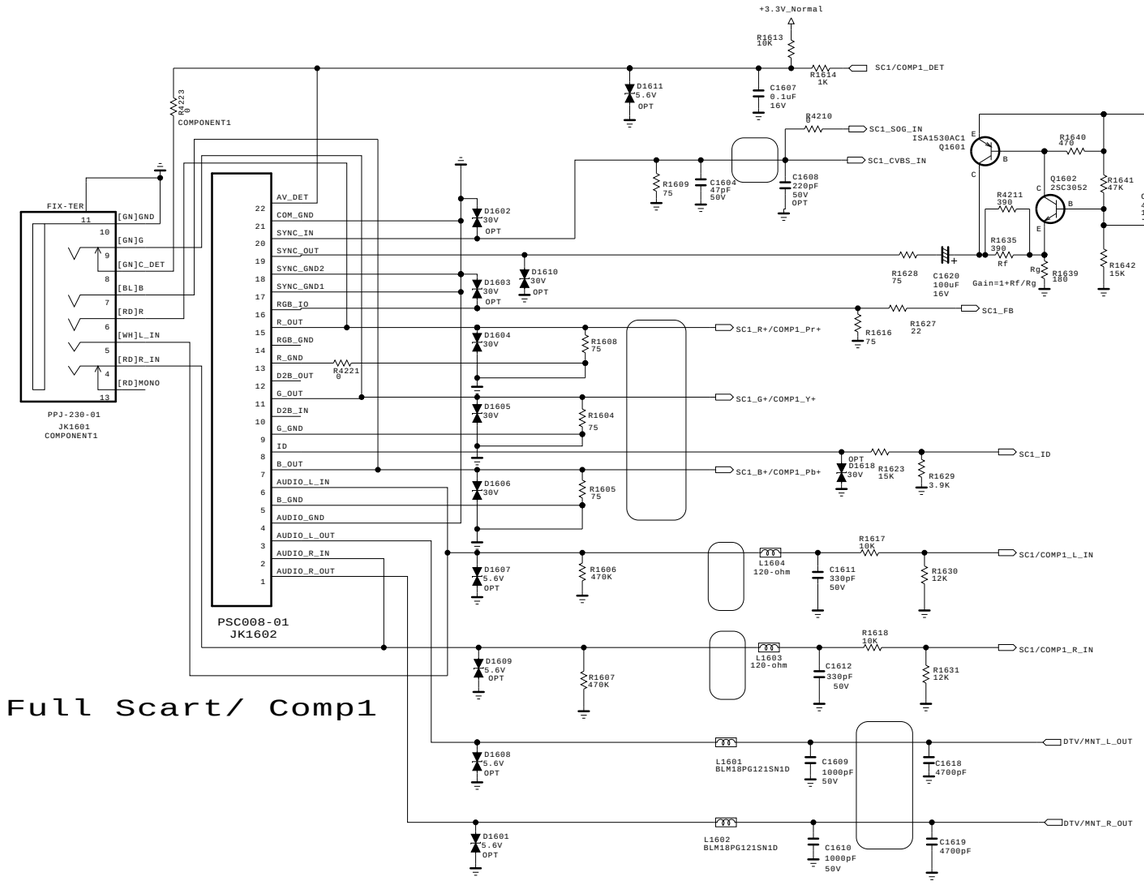
[SCART/EXT AUDIO 1st AMP]



IC1600-*1
AS324MTR-E1



Full Scart/ Comp1



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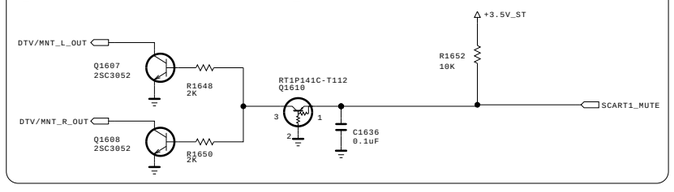
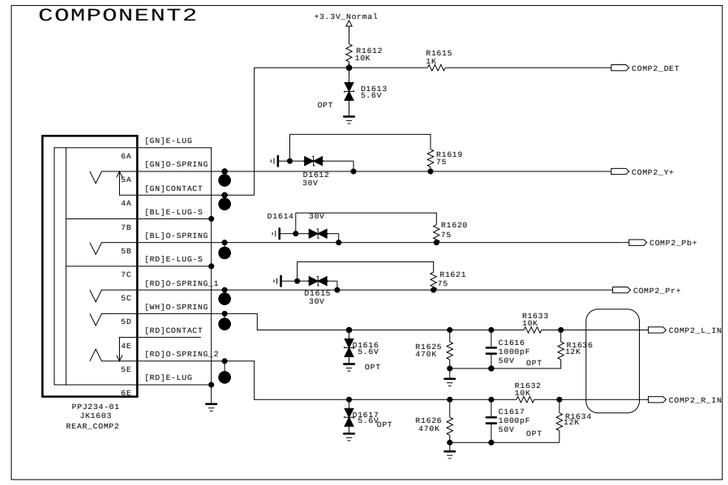


COMPONENT2



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BLOCK	SIDE_JACK	SHEET	18 /

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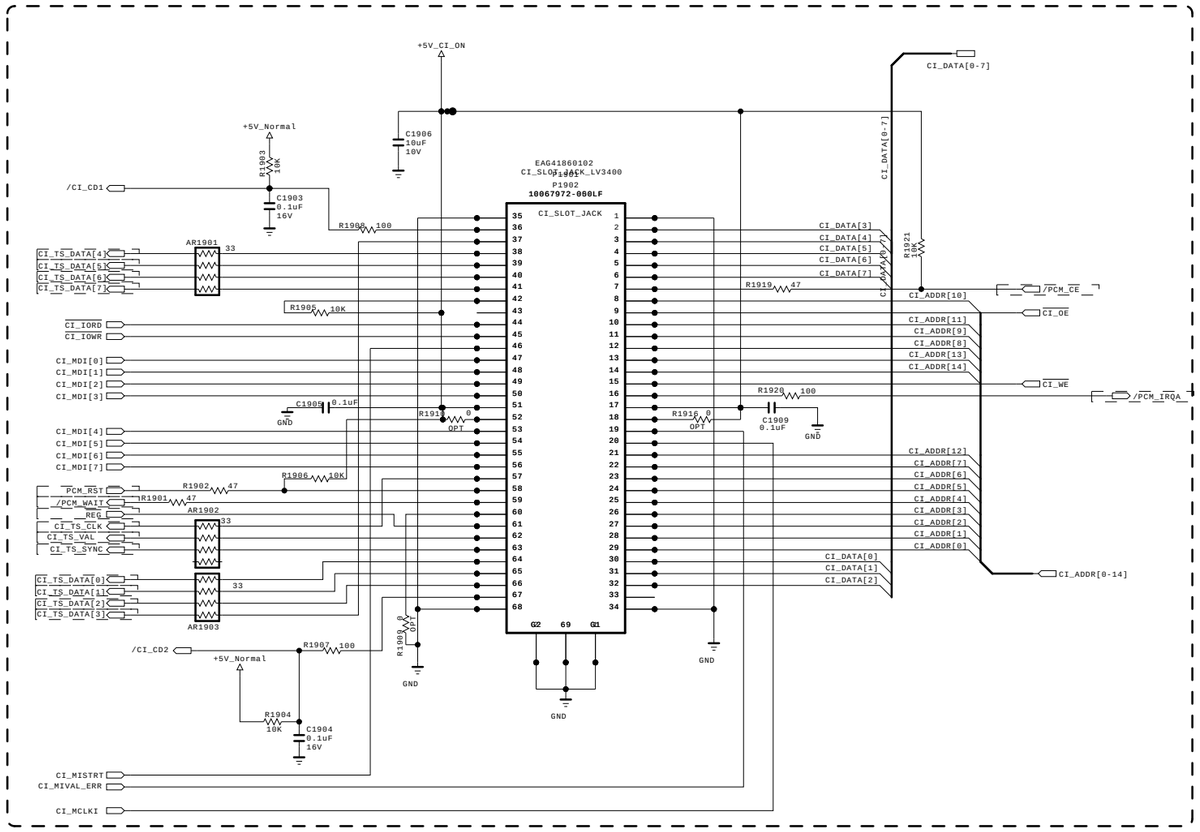
CI Region

* Option name of this page : CI_SLOT
(because of Hong Kong)

CI SLOT



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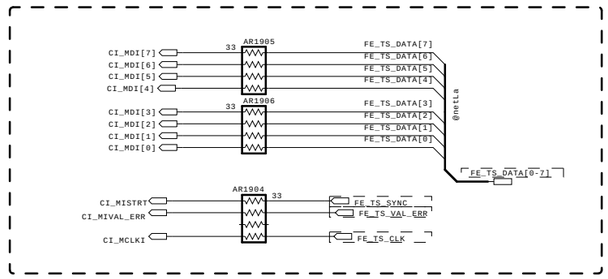

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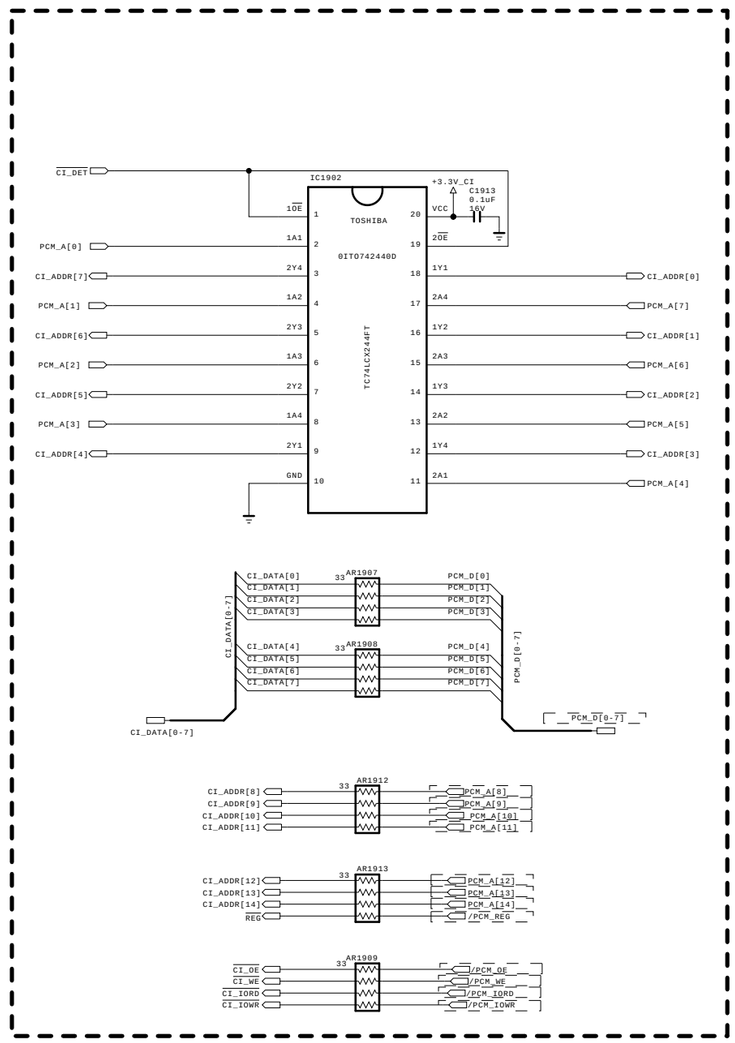
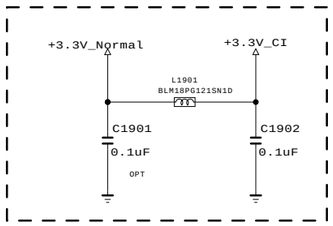
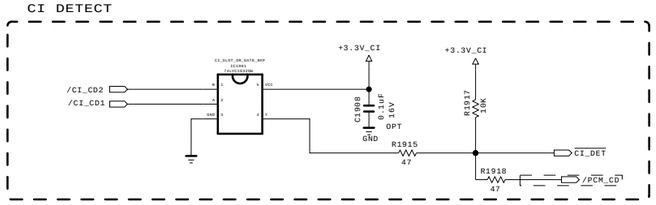
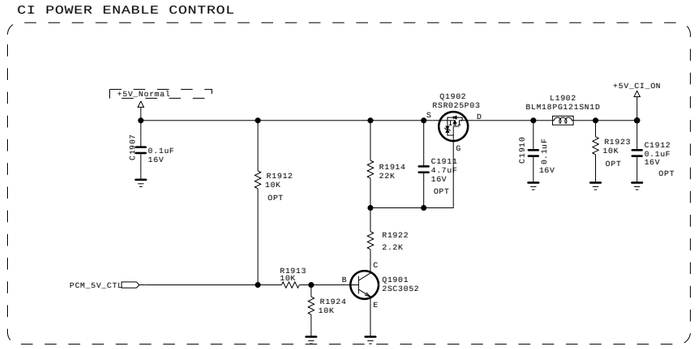




CI DETECT



CI POWER ENABLE CONTROL



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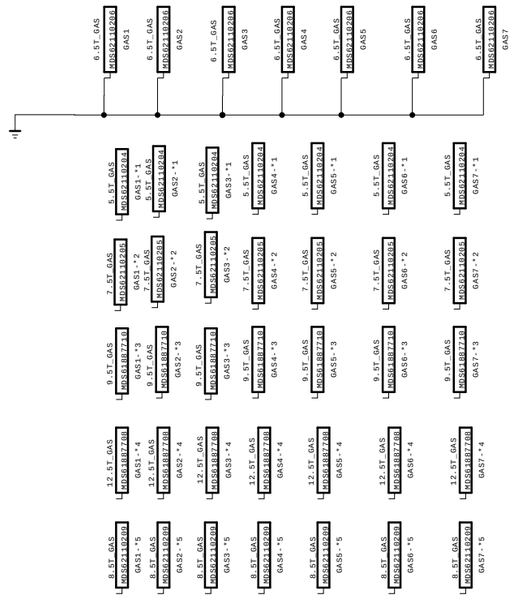
SMD GASKET



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BLOCK	SMD_GAS	SHEET	20 /

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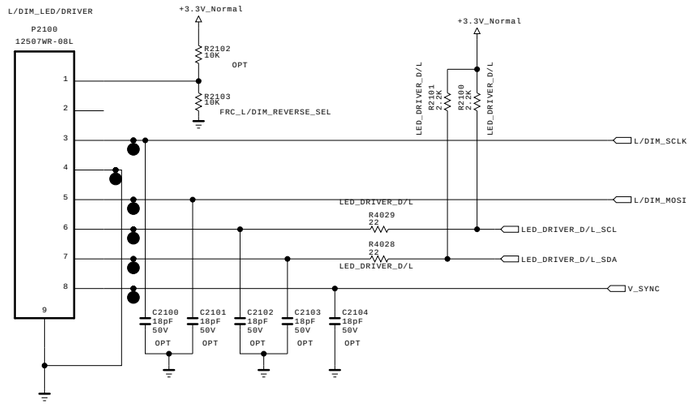

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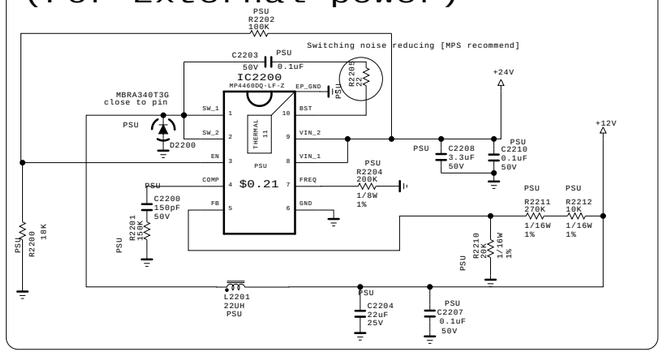
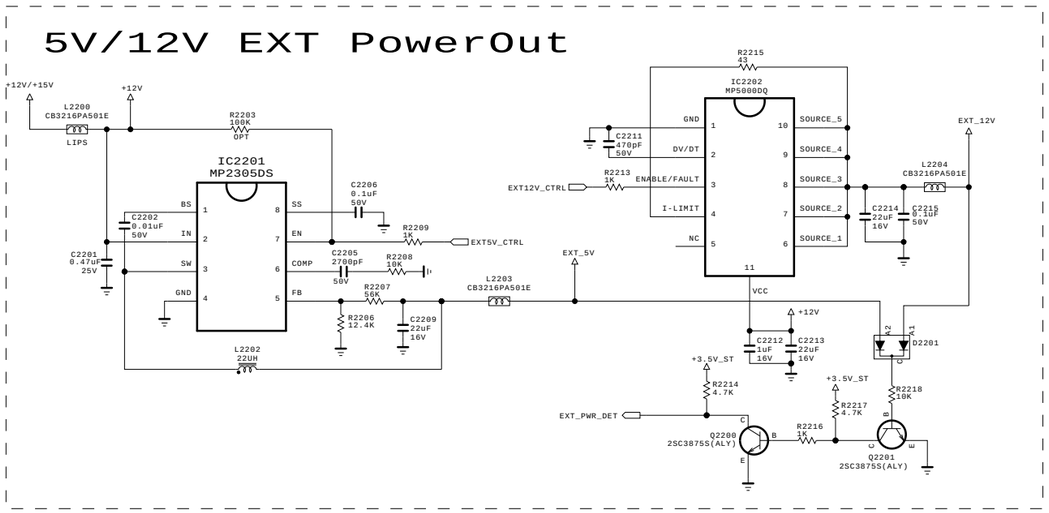
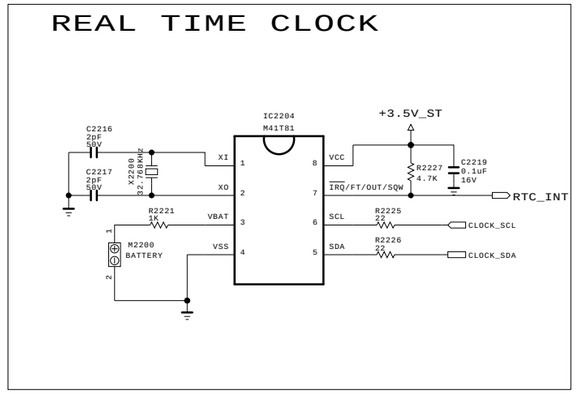
DC DC CONVERTER +12V (For External power)



5V/12V EXT PowerOut



REAL TIME CLOCK



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MODEL		DATE	
BLOCK		SHEET	/

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